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EXAMINATION OF ISSUES RELATED TO TWO-CAR REGIONAL EMISSION CONTROL STRATEGIES: VOLUME II. TECHNICAL DISCUSSION

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Aerospace Corporation

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EXAMINATION OF ISSUES RELATED TO TWO-CAR REGIONAL EMISSION CONTROL STRATEGIES:

VOLUME II - TECHNICAL DISCUSSION

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FOREWORD

This report, prepared by The Aerospace Corporation for the Environmental Protection Agency, Division of Emission Control Technology, presents the results of an examination of the issues related to two-car regional emission control strategy implementation.

The comments and statements attributed herein to domestic and foreign auto companies and state or city air quality control authorities were expressed either during data acquisition visits or by letter or telephone correspondence in the period 7 March 1973 through 30 March 1973.

The results of this study are presented in two volumes. Volume I, Executive Summary, presents a brief, concise review of important findings and conclusions in the Highlights and Executive Summary sections. Volume II, Technical Discussion, provides a detailed discussion of each study topic and is of interest primarily to the technical specialist. In this volume, passenger car population location, air quality effects, and car movement and migration factors are delineated in Section 2. A summary of potential two-car strategy compliance assurance measures, current and new procedures, and associated problem areas is presented in Section 3. The position of the automobile manufacturers with regard to two-car strategy implementation, with particular emphasis on ability to produce, market, and service two new car classes, is discussed in Section 4. The reactions of potentially-involved state or regional air quality control authorities with regard to compliance assurance capability and air quality impact under a two-car strategy are treated in Section 5. Possible effects of the two-car strategy on the vehicle user are summarized in Section 6. Section 7 contains a brief discussion of possible effects on the used-car and replacement parts industries. Appendix A contains a listing of the companies and agencies contacted in the data acquisition activity. Appendixes B through G contain backup information relative to the study.

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Appreciation is acknowledged for the guidance and assistance provided by Mr. F. P. Hutchins of the Environmental Protection Agency, Division of Emission Control Technology, who served as EPA Project Officer for this study.

The following technical personnel of The Aerospace Corporation made valuable contributions to the examination performed under this contract.

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HIGHLIGHTS

An examination and summarization was made of available information pertaining to issues relevant to potential implementation of a one-year two-car regional emission control strategy for the 1975 model year. Two different two-car strategy options were specified by EPA for examination. The first, or California-only strategy option, would require that new cars sold in the State of California meet a low-emission standard such as the 1975 Federal emissions standards, while vehicles sold in all other states would meet a higher-emission standard such as the 1973/74 Federal emissions standards. The second, or California-plus strategy option, increases the area of stricter control by adding up to 16 air quality control regions to California as areas requiring the sale of low-emission 1975 model cars; again, the rest of the United States would use higher-emission 1975 model cars.

Assessment of the available data as of the time of data acquisition visits and technical discussions (March 7 to March 30, 1973) resulted in the following findings.

1. The California-only two-car strategy would require approximately 11 percent of the 1975 model year passenger cars sold in the United States to meet the lower emission standards. Most of these cars would require catalysts to do so. This would represent from 5 to 10 percent of the United States new car sales of individual domestic auto manufacturers and up to 30 percent of the United States new car sales of individual foreign auto manufacturers.

2. The California-plus two-car strategy could require up to 33 percent of the 1975 model year passenger cars sold in the United States to meet the lower emission standards. This would represent from 24 to 33 percent of the United States new car sales of individual domestic auto manufacturers and up to 52 percent of the United States new car sales of individual foreign car manufacturers.

3. Under either of these one-year control strategies there is no dramatic improvement in air quality in the control regions with the lower

emission cars. The regions would have an approximately 10 percent (1-3 ppm) reduction in CO and an approximately 5 percent (0.001-0.02 ppm) reduction in oxidant level beyond the level that would result if only 1974 emission standards were in effect throughout the 1975 model year.

4. In terms of oxidant level reduction benefits resulting from compliance with 1975 emissions standards, the State of California would appear to benefit the most by being a control region. Four of the California cities are among the seven cities exhibiting the greatest oxidant level reduction, and three of these cities (Los Angeles, San Diego, and San Francisco) are among the four cities with the greatest oxidant reduction potential.

5 With the exception of Chrysler, which opposes any strategy requiring the use of catalysts, the domestic auto manufacturers generally favor the California-only two-car strategy. This strategy would only require catalysts on from 5 to 10 percent of each manufacturer's new 1975 cars for United States sales. The same companies are generally opposed to the California-plus strategy, primarily on the basis of assembly, distribution, and marketing difficulties. If the California-plus strategy were implemented, however, the opinion of these companies is that any added geographical areas should be as large as possible.

6 Foreign automakers generally oppose any mandatory two-car strategy; they prefer optional phasing-in processes for catalysts. With regard to the California-only strategy they feel that the percentage of their United States car sales in California is much too large to represent a reasonable test sample size (e.g., Nissan ~30%, Toyota ~24%, Volkswagen ~17%). Their distribution and marketing problems would further escalate under the California-plus strategy. However, their car sales in California are a relatively small portion of their overall passenger car output (e.g., Nissan ~5.01%, Toyota ~4.67%, Volkswagen ~5.38%).

7. Two classes of cars can be produced; however, there is an associated degree of difficulty which varies inversely with the size of the auto company (being more of a problem as the company gets smaller). The California-only strategy, aside from any catalyst-system-unique production problems, is not unusual since the auto companies have produced California-unique emission control systems since 1966. The California-plus strategy would require that more vehicle assembly plants become involved in the manufacture of catalyst-equipped cars and would entail additional complexity. Additional assembly plants would have to be converted; cross-shipping of cars might also be required (at additional consumer expense).

8. Two classes of cars can be marketed and serviced; however, there is a major impact on the ability to do so resulting from the number of control regions involved. The California-only strategy, with the exception of catalyst-system-unique parts storage and service requirements, has been in effect since 1966 with marketing and servicing groups set up to handle the California region and, again, is not unusual. The California-plus strategy may be highly disruptive of distribution, sales, and service channels unless the additional areas are sufficiently large. Although not an impossible task, it could be very difficult to provide a full model mix of new cars and adequate service to all cities potentially involved in such a strategy. The degree of difficulty, of course, increases as control areas are added.

9. The car pricing policy under the two-car strategy has not as yet been determined by the manufacturers (e.g., adding catalyst cost increase to cars so equipped vs spreading cost increase over all cars). It has been suggested by General Motors that the catalyst could best be handled as a "mandatory option" as was done in California for other emission control components. According to Ford, the warranty interpretation under the two-car strategy would remain as is (replace defective parts).

10. Benefits claimed for the California-only strategy by the auto industry are primarily economic in nature (e.g., more learning time, lessened assembly-line impact, warranty-recall cost statistics accumulated at limited risk, etc.). The companies also feel that service, parts distribution, and training can be more thoroughly accomplished and evaluated in a limited area.

11. Disadvantages attributed to the California-only strategy by the auto industry include: the one-year time period may not permit enough mileage accumulation on catalyst systems, and the California sales percentage of some imports is much larger than that of domestic automakers, thus posing a more severe burden on the foreign automakers.

12. No benefits are claimed for the California-plus strategy by the auto industry. The companies feel that this strategy has several inherent disadvantages, including: it increases manufacturing and distribution problems; it involves a complex and difficult enforcement system; it is very disruptive of normal channels of distribution, sales, service, and enforcement; and any areas added to California would have to be large geographically since the strategy gets less and less feasible as the control regions get smaller.

13 The principal impact on the purchaser of a catalyst-equipped car in the control region is economic in nature. In addition to the higher purchase price (unless cost increases are spread over all cars), the owner of a low-emission catalyst car is subject to the loss of the extra cost of the catalyst system on resale if sold outside of the control region. Also, if higher-emission non-catalyst 1975 cars were permitted into control regions, as used cars without catalyst retrofit, such cars could undersell the catalyst-equipped cars. This could create a strong demand within the control region for higher-emission 1975 used cars from outside the region, and make the resale of catalyst-equipped cars difficult.

14. Owners of low-emission cars may encounter difficulties in obtaining replacement parts if problems develop on trips outside the control region (24 hours delays are likely, in some cases), and service in such areas from mechanics with little or no experience on the low-emission system may be of poor quality.

15. Catalyst-equipped cars require unleaded gasoline to function properly in reducing emissions and to prevent degradation with lifetime. In recognition of this requirement, present Federal regulations call for unleaded gasoline to be available throughout the nation by July 1974. Supply of unleaded gasoline outside a control region was cited as an item of major concern for users of catalyst-equipped low-emission cars on trips outside a control region, since it will be difficult to ensure that all stations stock a fuel for which there may be little demand.

16. Any requirement to retrofit higher-emission 1975 model cars (non-catalyst) with 1975 low-emission vehicle control systems (catalyst) would be a severe one. It may be physically possible, but it would be economically impractical unless both emission control systems were essentially the same except for the catalytic converter. This means that retrofit to factory-installed system features and performance levels has to be planned for in advance of 1975 model year production commencement.

17. Most states foresee many problems in administering the two-car strategy, if it were based on regional control within a state; on that basis, statewide control would be generally preferred. On the other hand, since many of the air quality regions have their automotive pollution problems concentrated in smaller central business district areas, the states also foresee many objections to having stringent control implemented outside of those areas. If price differences between low-emission and higher-emission cars were large, the problems associated

with a metropolitan area regional control strategy would be accentuated. The general feeling was that it would not be worth the difficulty of setting up complicated administrative procedures to assure compliance with the short-lived, one-year, two-car strategy.

18. Most states or regions would favor the California-only two-car strategy if their air quality implementation plans were also delayed for one year (exceptions are New York City and the District of Columbia). Although their air quality would be adversely affected, the impact is considered small.

19. California has serious reservations about being the only state in the nation with catalyst-equipped cars in 1975, unless such cars were to be in general use in other states in the following year. If this were done, California would accept the California-only strategy for just one-year, but only if EPA enforced its mandate for a supply of unleaded gasoline throughout the country.

20. California is the only state that has existing procedures for administering a car control program to standards other than Federal nationwide emission standards. California presently has an assembly-line inspection program and requires a certificate of compliance with California emission standards as a condition to sale and registration of new cars sold in the state. Also, California's size, population distribution, and natural borders tend to enhance two-car strategy control feasibility.

21. All states (including California) lack the ability to strictly enforce the two-car strategy on a 100 percent compliance basis. There are numerous loopholes in existing registration laws (lack of verification of vehicle domicile, "used-car" provisions, etc.) as well as fleet-sale (sold in one state, delivered and used in another) and border dealer problems. The time required to pass the necessary laws to completely close existing loopholes and to set up enforcement provisions is most likely not compatible with the 1975 model year time frame.

Some statements made here and elsewhere throughout the report may appear to endorse or disapprove of one facet or another of two-car stragegy implementation. This is a result of attempting to make the fullest possible identification and discussion of the pro's and con's of the many issues potentially associated with the two-car strategy. Such discussions naturally result in positive or negative statements when relating fact or opinion from a given point of view, and the broadest possible spectrum of affected parties was addressed in this study. Individually and in total, however, this study and its issue-oriented subparts do not in any way represent an endorsement or lack thereof, or a recommendation for or against a two-car strategy of any type.

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SECTION 1

INTRODUCTION

1.1 BACKGROUND, OBJECTIVES AND SCOPE

Prior to the Suspension Request Rehearings[1] of March, 1973, several auto manufacturers suggested that it would be advisable and beneficial for the nation to embark on a two-car strategy in model year 1975. These proposals were similar in that they were all founded on the asserted inability to meet 1975 light-duty vehicle Federal emission standards as currently promulgated; beyond this point the similarity ended. One such proposal involved incorporating catalysts on 1975 cars in California only in order to provide a number of immediate benefits to the auto industry (learning time, lessening of assembly-line impact, etc.), and, hopefully, provide later benefits to the nation's new car buyers (increased reliability, lower costs, etc.) when such catalysts were eventually produced nationwide. Under this plan, the rest of the nation would use 1975 model cars meeting 1974 Federal emission levels.

A second proposal recommended a two-car strategy wherein a "low-emission" car would be used in all areas of the U.S. wherein automotive pollution is a serious local problem and a high-emission car (slightly lower than 1974 levels) would be used in the rest of the nation. The "low-emission" car in this plan would meet emission standards substantially above currently-promulgated 1975 emission standards and might not use a catalyst to achieve these levels. In addition, under this proposal, such a two-car strategy would be semipermanent, and not an immediate step toward meeting Federal 1975/76 standards on a nationwide basis.

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[1] Those hearings held on remand from the United States Court of Appeals for the District of Columbia Circuit relative to applications for suspension of the 1975 motor vehicle exhaust emissions standards.

1.2 ACQUISITION OF RELEVANT DATA

Nearly all data reported herein were acquired and developed between 7 March 1973 and 30 March 1973. Principal data sources were technical discussions held during this period with representatives of the automotive industry and with representatives of state and/or city agencies responsible for formulating and enforcing local or regional air quality criteria. Table 1-2 summarizes the companies and agencies contacted.

Table 1-2. Companies/Agencies Contacted

COMPANIES	
AMERICAN MOTORS	V
CHRYSLER	L
FORD	V
GENERAL MOTORS	V
INT'L HARVESTER	L
DATSUN	L
HONDA	L
MERCEDES-BENZ	L
TOYO KOGYO	L
TOYOTA	L
MVMA	V
R. L. POLK	V
VOLKSWAGEN	L

V = Visit
L = Letter with Telecon follow-up
T = Telecon only

STATE AGENCIES	
ALASKA	T
ARIZONA	V
CALIFORNIA	V
COLORADO	V
MARYLAND	T
MASSACHUSETTS	T
MINNESOTA	T
NEW JERSEY	V
NEW YORK	V
NEW YORK CITY	V
OREGON	V
PENNSYLVANIA	V
TEXAS	V
UTAH	T
VIRGINIA	T
WASHINGTON	T
WASHINGTON D.C.	V

Appendix A contains a listing of each visit or communication, including date of contact, company/agency contacted, and personnel involved.

In all cases of visit or letter contact, an outline of the major elements of interest in the study was utilized to form the basis of discussion and/or reply. This outline is included herein as Appendix B.

The identification of the candidate air quality control regions (ACQRs) to be considered in the California-plus control strategy option was provided by EPA. Appendix C contains a geographical breakdown (by county) for each ACQR considered.

In addition to visits and letter contacts, the Air Quality Implementation Plan for each affected state (except Utah) was acquired and reviewed for relevant descriptive material, planning, and enforcement information. Also, where available, the studies performed for EPA regarding transportation control strategies to reduce motor vehicle emissions in the major metropolitan areas contained in the California-plus regions were reviewed for relevant information.

In order to provide a consistent data base for car population location and effects determination, passenger car registration data were obtained from the R. L. Polk Company for the air quality control regions of interest, in most cases at the county level breakdown.

Many other documents of related interest were reviewed during the course of the study and are referenced herein where they are of particular relevance.

1.3 METHOD OF REPORTING

The results of the study are reported in the following order and context:

Section 2 - Car Population Location and Effects:
An identification of domestic, import, and total passenger car registrations in the air quality control regions of interest; an analysis of the effect of control strategy implementation on air quality; a summary of auto movement and migration factors for the various air quality regions.

Section 3 - Potential Compliance Assurance Measures:
A brief summarization of potential compliance assurance measures, current and new procedures, and associated problem areas.

Section 4 - Auto Industry Considerations:
Includes a detailed as well as summary overview of the current attitudes and reactions of the auto industry to two-car strategies. Includes delineation of foreseeable advantages and disadvantages attendant to control strategies examined, including compliance assurance measures.

Section 5 - State or Regional Considerations:
Includes both a summary and detailed review of the reactions of potentially involved state and/or regional control authorities. Extends to the impact on current air quality implementation plans, compliance assurance potential, and region-peculiar factors.

Section 6 - Vehicle User Effects:
A brief summary of the possible impact of a two-car strategy on the vehicle user in terms of operational and maintenance effects, cost effects, compliance assurance requirements, and ability to acquire unleaded gasoline for catalyst-equipped car.

Section 7 - Corollary Issues:
A short summary of possible impacts on the used-car and replacement parts industries.

It is to be noted that the content of Section 3 overlaps to some extent with portions of Sections 4, 5, and 6. The auto industry, state governments, and vehicle owners may all be intimately affected by compliance assurance measures which could be implemented under a two-car control strategy. For completeness of thought and purpose, individual comments regarding compliance assurance are given in Sections 4, 5, and 6 to enable a complete picture of the overall response of the company/agency in question. The compliance assurance measure issue is initially summarized in Section 3 to present a concise view of the nature of the compliance-assurance problem prior to stating individual company/agency responses to the issue.

SECTION 2

CAR POPULATION LOCATION AND EFFECTS

The physical numbers and locations of the existing passenger car population in the United States were examined for their effects under a two-car strategy on potential 1975 new car sales distributions, metropolitan area air quality, and car migration factors. The following sections summarize the significant results of these examinations.

2.1 VEHICLE REGISTRATION DATA AND EFFECTS

2.1.1 Introduction

Passenger car registration data presented in this section are based on information received from R. L. Polk and Company, (Ref. 2-1), covering domestic and foreign passenger cars in operation in the U.S. as of July 1, 1972. These data are further broken down by vehicle make, model year, and county of registration within each Air Quality Control Region (AQCR) of concern.

State motor vehicle registration data, obtained during visits to each state's motor vehicle departments, were found to be as much as 10% higher than R. L. Polk data. These differences in passenger car registrations may be attributed to several factors. One of these is that the available state statistics were mixed with respect to the period of registration and in many cases included light-duty pick-up trucks and vans within the passenger car category.

Other differences include such factors as late or delinquent registrations not recorded by the state in time to be tabulated by R. L. Polk and the double count experienced by California (Ref. 2-2) whereby, for example, a car first registered in September of a given year and renewed in the annual registration in February would be counted twice within the fiscal year, since the state registration data represents "processed work load" rather than the number of separate vehicle registration .

Therefore, in order to provide a consistent set of data based only on passenger car registrations, the R. L. Polk data have been used in this section unless otherwise indicated.

2.1.2 Vehicle Registrations

The total number of passenger cars in operation in the United States as of 1 July 1972 was 86,438,957, of which 8,737,555 (10.1 percent) were of foreign manufacture. A summary breakdown of these totals by AQCR is presented in Table 2-1. It should be noted that the figure shown in this table for California is for the entire state rather than specific AQCRs.

The number of passenger cars within each state encompassing an AQCR is presented in Table 2-2, from which it can be seen that 49 percent of all U.S. passenger cars are within the 18 states listed.

Table 2-1. Car Registrations Summary
(by Air Quality Control Regions)

AIR QUALITY CONTROL REGION (AQCR)	PASSENGER CAR REGISTRATIONS			PERCENT OF U.S. TOTAL	
	DOMESTIC	FOREIGN	TOTAL	INDIVIDUAL	CUMULATIVE
1 CALIFORNIA (entire state)	7,534,754	1,809,696	9,344,450	10.81	10.81
2 HOUSTON, TEX	870,449	86,742	957,191	1.11	11.92
3 PHOENIX/TUSCON, ARIZ	624,307	90,542	714,849	0.83	12.75
4 SOUTH LA & SOUTHEAST TEX	1,120,510	99,740	1,220,250	1.41	14.16
5 BOSTON, MASS	1 129,069	140,617	1,269,686	1.47	15.63
6 PHILADEPHIA, PA	1,268,820	153,737	1,422,557	1.65	17.28
7 PORTLAND, ORE	674,244	132,684	806,928	0.93	18.21
8 FAIRBANKS, ALASKA	11,100	2,800	13,908	0.02	18.23
9 BALTIMORE, MD	769,624	91,155	860,779	1.00	19.23
10 NEW YORK CITY/NEW JERSEY	5,944,995	772,376	6,717,371	7.77	27.00
11 SPOKANE, WASH	204,831	27,406	232,237	0.27	27.27
12 DENVER, COL	552,023	101,750	653,773	0.76	28.03
13 WASHINGTON, D.C.	1,090,503	76,916	1,167,419	1.35	29.38
14 PITTSBURGH, PA	1,005,013	94,212	1,099,225	1.27	30.65
15 SEATTLE, WASH.	718,153	134,373	852,526	0.99	31.64
16 MINNEAPOLIS/ST PAUL, MINN	930,095	66,153	996,208	1.15	32.79
17 SALT LAKE CITY, UTAH	275,233	41,074	316,307	0.37	33.16
AQCR TOTALS	24,723,691	3 921,973	28,645,664	33.14	
U.S. TOTALS	77,701,402	8,737,555	86,438,957		
AQCR, % U.S. TOTAL	31.82	44.89			

Table 2-2. Car Registrations by States with AQCR

STATE	TOTAL	PERCENT OF U.S. TOTAL	
		INDIVIDUAL	CUMULATIVE
CALIFORNIA	9,344,450	10.81	10.81
TEXAS	4,617,455	5.34	16.15
ARIZONA	842,893	0.98	17.13
LOUISIANA	1,323,596	1.53	18.66
MASSACHUSETTS	2,228,662	2.58	21.24
PENNSYLVANIA	4,690,633	5.43	26.67
OREGON	963,936	1.12	27.79
WASHINGTON	1,515,485	1.75	29.54
ALASKA	101,724	0.12	29.66
MARYLAND	1,488,071	1.72	31.38
NEW YORK	6,224,601	7.20	38.58
NEW JERSEY	3,260,464	3.77	42.35
IDAHO	308,769	0.36	42.71
COLORADO	1,091,215	1.26	43.97
WASH, D.C.	369,325	0.43	44.40
VIRGINIA	1,804,603	2.09	46.49
MINNESOTA	1,756,706	2.03	48.52
UTAH	456,502	0.53	49.05
TOTALS	42,389,090		

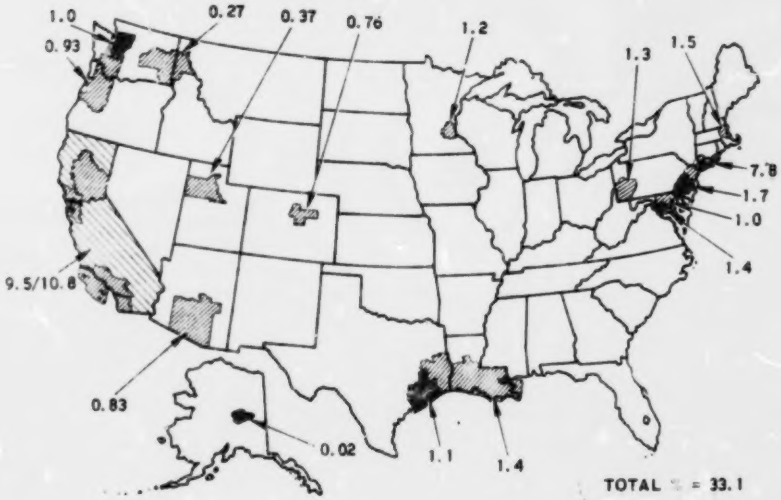


Figure 2-1. Two-Car Control Strategy Regions
Percent of U.S. Passenger Car Registrations

The number of passenger cars in operation within each AQCR expressed as a percentage of the U.S. total is shown in Figure 2-1. Dual figures are given for California, with 9.5 percent of the U.S. total being located within the AQCRs and 10.8 percent within the entire state.

The number of cars within each AQCR expressed as a percentage of the state total is shown in Figure 2-2. In those cases where the AQCR is located in 2 states (e.g., Portland, Spokane, etc.), the combined totals for the states involved have been used to obtain the indicated percentages. Within California, 87.5 percent of the cars are within the specified regions, while 100 percent would be considered in the case of a California-only two-car strategy. New Jersey is also shown as 100 percent since all 21 counties within the state were included in the New York City/New Jersey Air Basin.

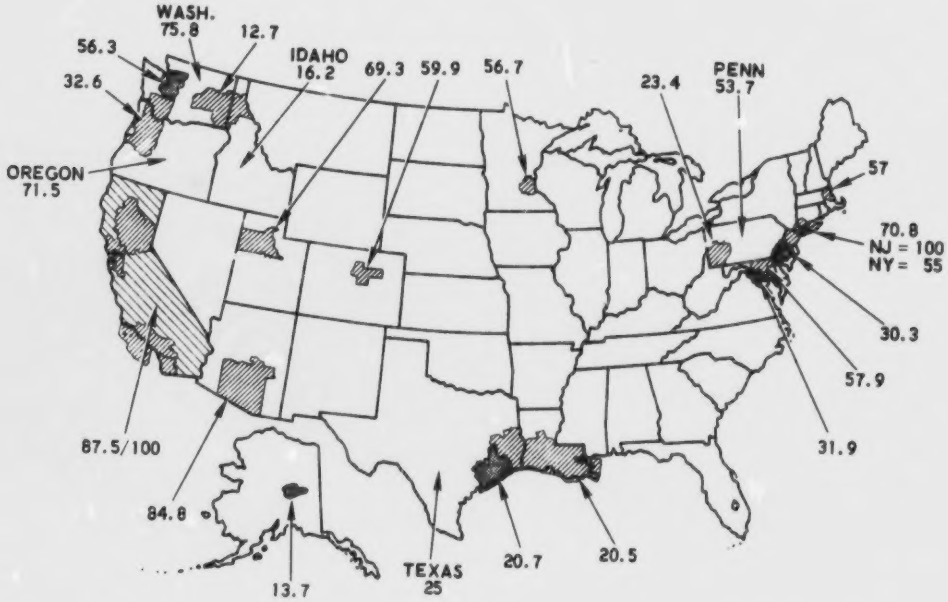

WASH.
75.8
12.7
56.3
32.6
IDAHO
16.2
69.3
59.9
56.7
23.4
PENN
53.7
57
70.8
NJ = 100
NY = 55
OREGON
71.5
30.3
57.9
87.5/100
31.9
84.8
13.7
TEXAS
25
20.7
20.5

Figure 2-2. Two-Car Control Strategy Regions
Percent of State(s) Registration Included in Region

A more detailed delineation of both population and passenger cars in operation within each AQCR and state is presented in Appendix C wherein AQCR, State, and U.S. totals are shown as well as the percentage of U.S. totals within each region and state.

The percentage of domestic new car registrations (1971) of the 1971 total within each AQCR is shown in Figure 2-3. The complementary percentage for total (1971) foreign cars is shown in Figure 2-4. Both figures clearly indicate a significantly higher percentage of foreign cars in the far western AQCRs.

2.1.3 Vehicle Registrations by Manufacturer

The relative impact of each of several individual auto manufacturers was examined in terms of the percentage of cars within each AQCR

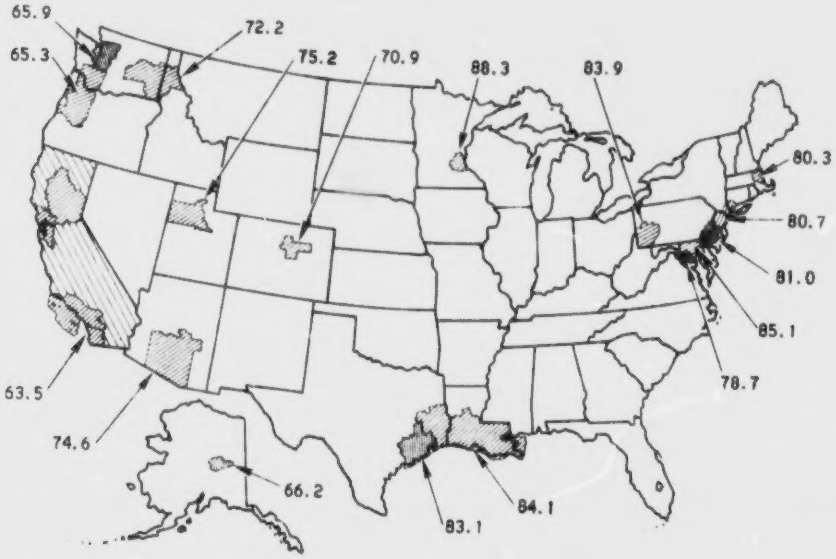


Figure 2-3. Two-Car Control Strategy Regions

Percent of 1971 Domestic Car Sales as Percent of Total Sales within Indicated Region

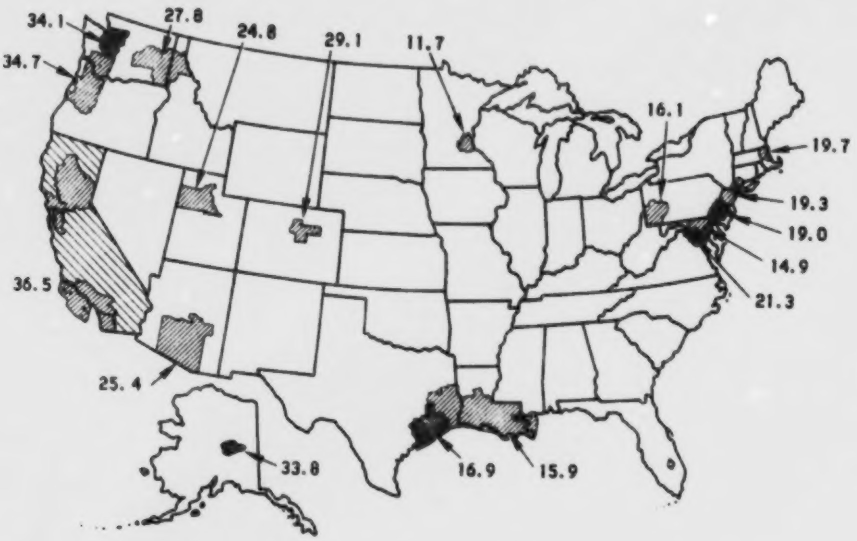


Figure 2-4. Two-Car Control Strategy Regions
Percent of 1971 Foreign Car Sales as Percent
of Total Sales within Indicated AQCR

as well as the percentage of their total new car registrations within each region. Data for four domestic manufacturers (American Motors, Chrysler, Ford, and General Motors) and three foreign manufacturers (Datsun, Toyota, and Volkswagen) were examined based upon the R. L. Polk data in conjunction with new car registration totals by manufacturer (as reported in Refs. 2-3 and 2-4).

The four domestic manufacturers accounted for 99.94 percent of all domestic new car registrations and 84.9 percent of the U.S. total for 1971. The three foreign manufacturers accounted for 65.6 percent of all imports in 1971 and 9.9 percent of the U.S. total. Virtually the entire remaining 5 percent of the U.S. total was accounted for by all other imports.

The relative position within each AQCR is summarized for the domestic manufacturers in Table 2-3. It will be noted that approximately

Table 2-3. 1971 Passenger Car Registrations
Domestic Automobile Manufacturers

AIR QUALITY CONTROL REGION (AQCR)	GENERAL MOTORS %			FORD %			CHRYSLER %			AMERICAN MOTORS %		
	AQCR	GM TOTAL	CUM GM TOTAL	AQCR	FORD TOTAL	CUM FORD TOTAL	AUCR	CHR TOTAL	CUM CHR TOTAL	AQCR	AM TOTAL	CUM AM TOTAL
CALIFORNIA	26.78	5.34	5.34	24.34	9.32	9.32	11.36	7.46	7.46	2.04	7.34	7.34
HOUSTON	42.94	1.11	6.45	25.61	1.27	10.59	13.44	1.14	8.60	1.44	0.67	8.01
PHOENIX/TUCSON	33.09	0.48	6.93	25.76	0.71	11.30	13.87	0.66	9.26	3.16	0.82	8.83
SO. LA/TEXAS	41.22	1.20	8.13	26.31	1.47	12.77	15.60	1.47	10.73	1.16	0.61	9.44
BOSTON	38.35	1.37	9.50	24.12	1.65	14.42	16.15	1.89	12.62	1.22	0.78	10.22
PHILADELPHIA	40.97	1.40	10.90	21.82	1.44	15.86	15.28	1.73	14.35	3.24	2.00	12.22
PORTLAND	25.44	0.41	11.31	22.39	0.70	16.56	12.38	0.66	15.01	3.21	0.94	13.16
FAIRBANKS	25.08	0.008	11.32	23.46	0.015	16.58	13.29	0.015	15.03	4.67	0.029	13.19
BALTIMORE	44.89	1.14	12.46	29.84	1.46	18.04	16.71	1.40	16.43	2.66	1.23	14.42
N.Y./N.J.	41.41	7.27	19.73	19.99	6.74	24.78	17.39	10.06	26.49	1.99	6.32	20.74
SPOKANE	30.80	0.11	19.84	22.75	0.16	24.94	16.06	0.20	26.69	3.31	0.22	20.96
DENVER	28.99	0.42	20.26	25.07	0.70	25.64	13.20	0.63	27.32	2.86	0.75	21.71
WASH. D.C.	36.20	1.30	21.56	25.09	1.73	27.37	15.92	1.88	29.20	1.89	1.22	22.93
PITTSBURGH	37.74	1.09	22.65	23.50	1.30	28.67	13.66	1.30	30.50	3.41	1.77	24.70
SEATTLE	26.72	0.38	23.03	25.11	0.69	29.36	13.28	0.63	31.13	2.02	0.52	25.22
MINNEAPOLIS	40.68	0.91	23.94	26.82	1.15	30.51	17.14	1.26	32.39	3.73	1.51	26.73
SALT LAKE CITY	30.50	0.19	24.13	26.82	0.33	30.84	14.43	0.30	32.69	2.43	0.28	27.01
	35.38	24.14	--	23.56	30.84	--	14.56	32.70	--	2.19	27.03	--

24 to 33 percent of their 1971 passenger cars are located within the AQCRs of concern. By comparison, it will be noted in Table 2-4 that 48 to 52 percent of the foreign cars are located within the air basins. However, it should be noted that the United States sales of these companies are a relatively small portion of their overall passenger car output (e.g., Nissan ~ 8.62%, Toyota ~ 10.11%, Volkswagen ~ 15.09%).

The total of each manufacturer's vehicles, as a percentage of the AQCR total and as a percentage of the manufacturer's total, is shown graphically by AQCR for each of the four domestic and three foreign manufacturers in Figures 2-5 through 2-11. A more detailed breakdown is given in Appendix C.

2.1.4 Foreign New Car Registrations

Foreign new car registrations of the ten top makes in the United States, by make, are shown in Table 2-5 for each year from 1967 through 1971 (Refs. 2-4 and 2-5 for 1972). A breakdown by manufacturer is not yet available

Table 2-4. 1971 Passenger Car Registrations
Foreign Automobile Manufacturers

AIR QUALITY CONTROL REGION (AQCR)	VOLKSWAGEN %			TOYOTA %			DATSUN %		
	AQCR	VW TOTAL	CUM VW TOTAL	ACQR	TOYOTA TOTAL	CUM VW TOTAL	AQCR	DATSUN TOTAL	CUM DATSUN TOTAL
CALIFORNIA	9.97	17.15	17.15	7.47	24.19	24.19	6.30	30.32	30.32
HOUSTON	5.21	1.16	18.31	5.07	2.13	26.32	1.27	0.79	31.11
PHOENIX/TUCSON	8.38	1.04	19.35	5.44	1.28	27.60	3.99	1.39	32.50
SO LA/TEXAS	5.86	1.47	20.82	4.44	2.10	29.70	1.71	1.20	33.70
BOSTON	7.38	2.27	23.09	4.91	2.84	32.54	1.48	1.27	34.97
PHILADAPHIA	8.54	2.53	25.62	2.94	1.64	34.18	1.10	0.91	35.88
PORTLAND	8.60	1.21	26.83	6.39	1.69	35.87	6.50	2.56	38.44
FAIRBANKS	13.35	0.04	26.87	8.30	0.047	35.92	4.34	0.036	38.48
BALTIMORE	5.71	1.26	28.13	2.08	0.86	36.78	2.15	1.32	39.80
N.Y./N.J.	7.49	11.35	39.48	3.13	8.93	45.71	0.60	5.07	44.87
SPOKANE	9.29	0.30	39.78	4.14	0.25	45.96	6.54	0.59	45.46
DENVER	8.90	1.12	40.90	5.36	1.27	47.23	3.66	1.29	46.75
WASH. D.C.	6.59	2.04	42.94	2.43	1.42	48.65	2.10	1.82	48.57
PITTSBURGH	11.27	2.80	45.74	1.84	0.86	49.51	1.28	0.89	49.46
SEATTLE	8.33	1.03	46.77	6.19	1.44	50.95	5.53	1.91	51.37
MINNEAPOLIS	4.48	0.86	47.63	2.19	0.79	51.74	0.67	0.36	51.73
SALT LAKE CITY	8.71	0.48	48.11	5.83	0.60	52.34	3.18	0.49	52.22
	8.17	48.09	--	4.72	52.32	--	3.17	52.20	--

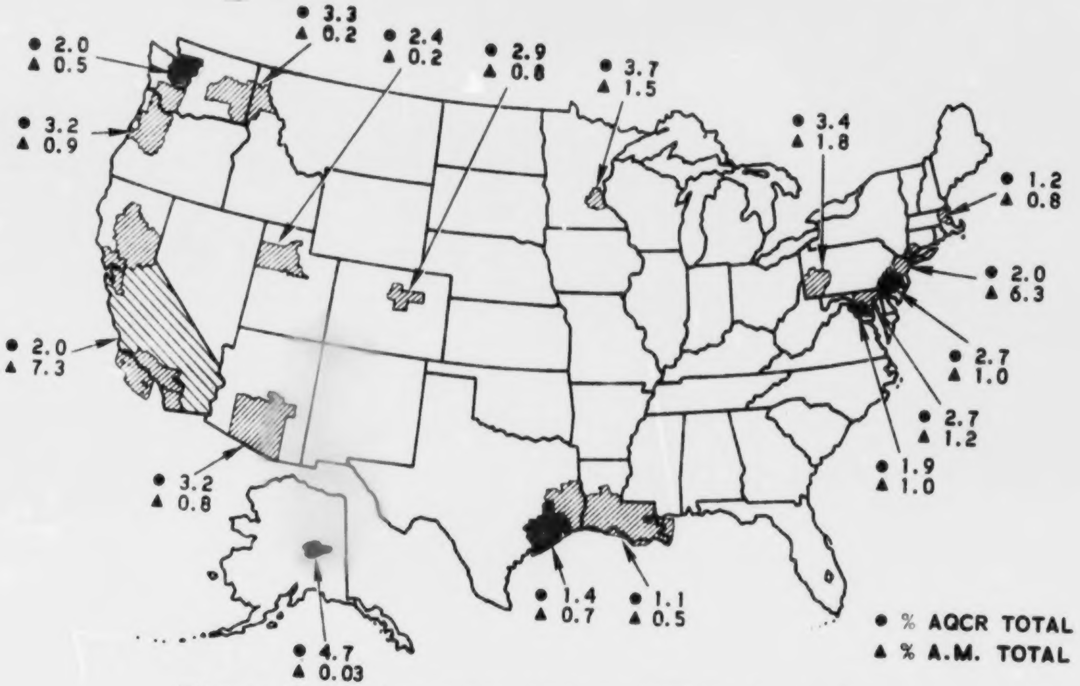


Figure 2-5. American Motors 1971 Registrations

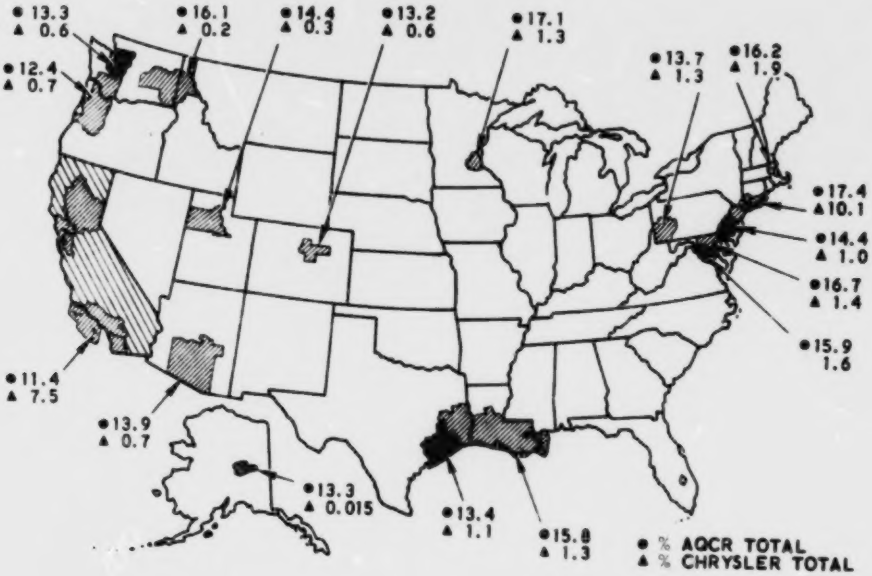
Table 2-5. U.S. New Imported Car Registrations, 1967/72 (Refs. 2-4 and 2-5)

Make	1967			1968			1969			1970			1971			1972 (P)		
	Registrations	% U.S.	Cum. % U.S.	Registrations	% U.S.	Cum. % U.S.	Registrations	% U.S.	Cum. % U.S.	Registrations	% U.S.	Cum. % U.S.	Registrations	% U.S.	Cum. % U.S.	Registrations	% U.S.	Cum. % U.S.
Volkswagen	452,947	5.4	5.4	563,522	6.0	6.0	537,933	5.7	5.7	569,182	6.8	6.8	509,207	5.2	5.2			
Toyota	33,280	0.4	5.8	68,779	0.7	6.7	117,384	1.2	6.9	184,898	2.2	9.0	270,512	2.8	8.0			
Datsun	34,028	0.4	6.2	40,219	0.4	7.1	58,569	0.6	7.5	100,541	1.2	10.2	182,058	1.9	9.9			
Opel	50,866	0.6	6.8	80,366	0.9	8.0	91,161	1.0	8.5	83,189	1.0	11.2	85,554	0.9	10.8			
Capri										15,628	0.2	11.4	5[illegible],219	0.5	11.3			
Volvo	34,192	0.4	7.2	38,135	0.4	8.4	36,448	0.4	8.9	44,630	0.5	11.9	47,012	0.5	11.8			
Fiat				28,377	0.3	8.7	41,519	0.4	9.3	36,642	0.4	12.3	42,621	0.4	12.2			
Mercedes-Benz	19,761	0.2	7.4	23,724	0.3	9.0	24,693	0.3	9.6	28,743	0.3	12.6	32,651	0.3	12.5			
MG	22,387	0.3	7.7	**			21,806	0.2	9.8	30,548	0.4	13.0	30,950	0.3	12.8			
Colt										*			26,503	0.3	13.1			
Renault	19,362	0.2	7.9	19,359	0.2	9.2	17,735	0.2	10.0	19,589	0.2	13.2						
English Ford	16,193	0.2	8.1	22,983	0.2	9.4	20,750	0.2	10.2									
Std Triumph	15,806	0.2	8.3	18,600	0.2	9.6				*			**					
All Others	80,208	1.0	9.3	81,503	0.9	10.5	93,619	1.0	11.2	117,371	1.4	14.6	185,386	1.9	15.0			
Total Imports	779,220			985,767			1,061,600			1,230,961			1,465,67[illegible]			1,428,500		
Total U.S.	8,357,421			9,403,862			9,446,524			8,388,204			9,729,109			9,834,500		
Imports, % U.S.	9.3			10.5			11.2			14.7			15.1			14.5		

* Not in production

** Not in top ten

(P) Preliminary and incomplete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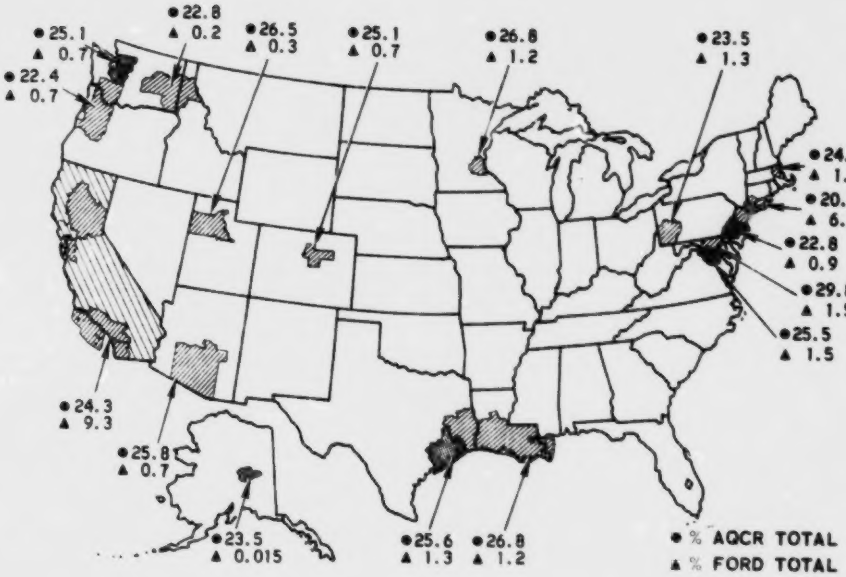
● 16.1
▲ 0.2
● 14.4
▲ 0.3
● 13.2
▲ 0.6
● 17.1
▲ 1.3
● 12.4
▲ 0.7
● 13.7
▲ 1.3
● 16.2
▲ 1.9
● 17.4
▲ 10.1
● 14.4
▲ 1.0
● 16.7
▲ 1.4
● 15.9
1.6
● 11.4
▲ 7.5
● 13.9
▲ 0.7
● 13.3
▲ 0.015
● 13.4
▲ 1.1
● 15.8
▲ 1.3
● % AQCR TOTAL
▲ % CHRYSLER TOTAL

Figure 2-6. Chrysler 1971 Registrations


● 25.1
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● 22.8
▲ 0.2
● 26.5
▲ 0.3
● 25.1
▲ 0.7
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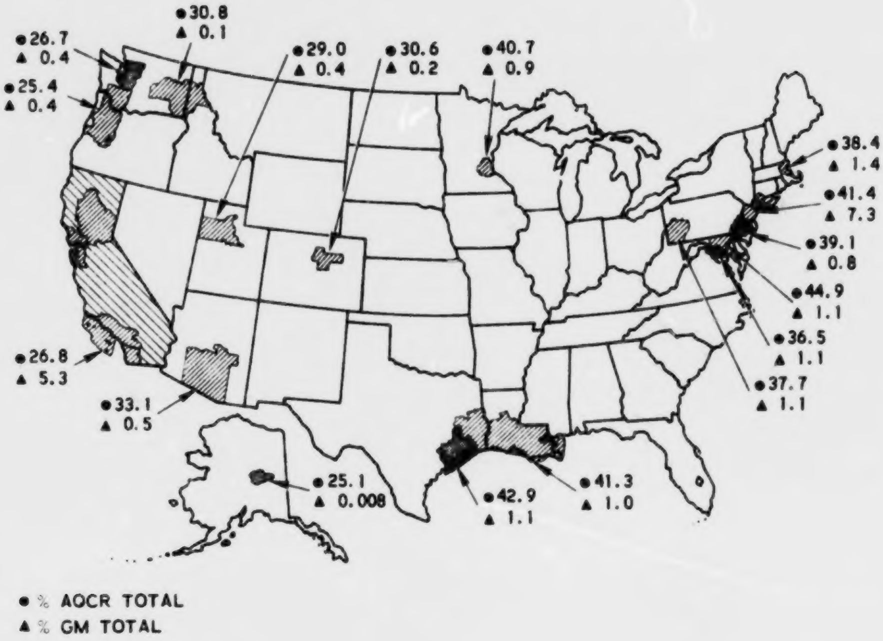
● 23.5
▲ 1.3
● 22.4
▲ 0.7
● 24.1
▲ 1.7
● 20.0
▲ 6.7
● 22.8
▲ 0.9
● 29.8
▲ 1.5
● 25.5
▲ 1.5
● 24.3
▲ 9.3
● 25.8
▲ 0.7
● 23.5
▲ 0.015
● 25.6
▲ 1.3
● 26.8
▲ 1.2
● % AQCR TOTAL
▲ % FORD TOTAL

Figure 2-7. Ford 1971 Registrations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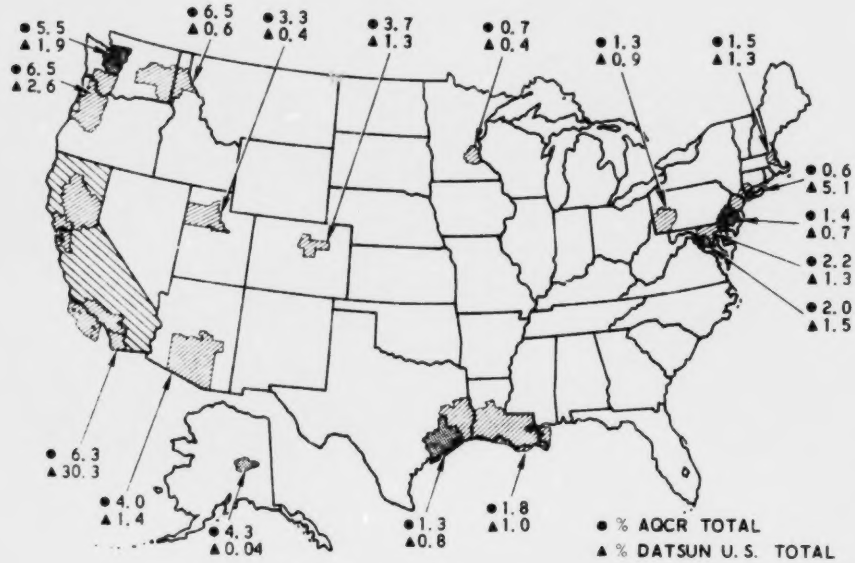
●30.8 ▲0.1
●25.4 ▲0.4
●29.0 ▲0.4
●30.6 ▲0.2
●40.7 ▲0.9
●38.4 ▲1.4
●41.4 ▲7.3
●39.1 ▲0.8
●44.9 ▲1.1
●36.5 ▲1.1
●37.7 ▲1.1
●26.8 ▲5.3
●33.1 ▲0.5
●25.1 ▲0.008
●42.9 ▲1.1
●41.3 ▲1.0
● % AOCR TOTAL
▲ % GM TOTAL

Figure 2-8. General Motors 1971 Registrations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●6.5 ▲0.6
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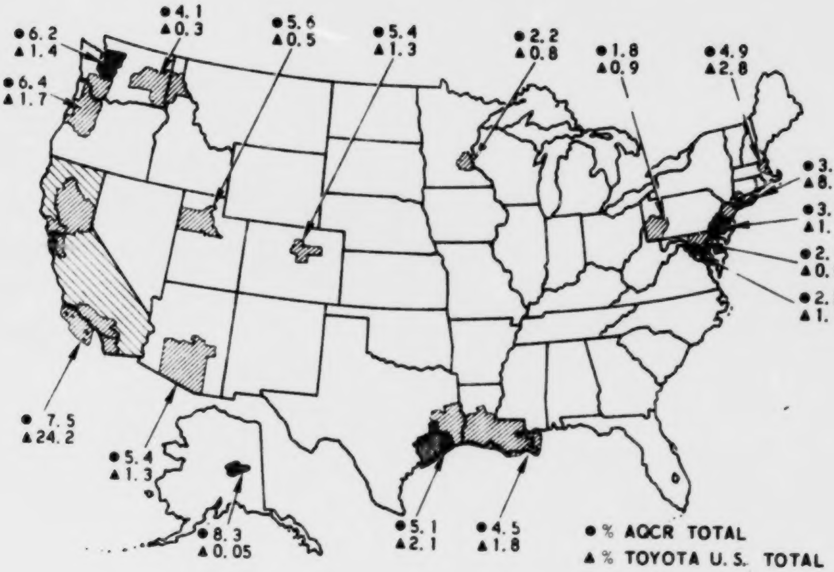
●3.7 ▲1.3
●0.7 ▲0.4
●1.3 ▲0.9
●1.5 ▲1.3
●6.5 ▲2.6
●0.6 ▲5.1
●1.4 ▲0.7
●2.2 ▲1.3
●2.0 ▲1.5
●6.3 ▲30.3
●4.0 ▲1.4
●4.3 ▲0.04
●1.3 ▲0.8
●1.8 ▲1.0
● % AOCR TOTAL
▲ % DATSUN U.S. TOTAL

Figure 2-9. Datsun 1971 Registrations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● 6.4 ▲ 1.7
● 4.1 ▲ 0.3
● 5.6 ▲ 0.5
● 5.4 ▲ 1.3
● 2.2 ▲ 0.8
● 1.8 ▲ 0.9
● 4.9 ▲ 2.8
● 3.1 ▲ 8.9
● 3.1 ▲ 1.1
● 2.1 ▲ 0.9
● 2.2 ▲ 1.1
● 7.5 ▲ 24.2
● 5.4 ▲ 1.3
● 8.3 ▲ 0.05
● 5.1 ▲ 2.1
● 4.5 ▲ 1.8
● % AQCR TOTAL
▲ % TOYOTA U.S. TOTAL

Figure 2-10. Toyota 1971 Registrations

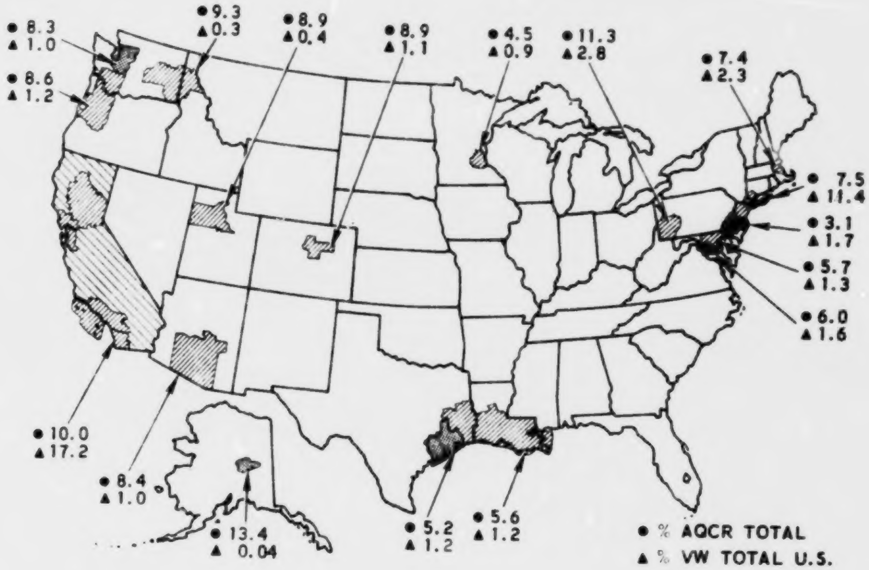
● 8.3 ▲ 1.0
● 8.6 ▲ 1.2
● 9.3 ▲ 0.3
● 8.9 ▲ 0.4
● 8.9 ▲ 1.1
● 4.5 ▲ 0.9
● 11.3 ▲ 2.8
● 7.4 ▲ 2.3
● 7.5 ▲ 11.4
● 3.1 ▲ 1.7
● 5.7 ▲ 1.3
● 6.0 ▲ 1.6
● 10.0 ▲ 17.2
● 8.4 ▲ 1.0
● 13.4 ▲ 0.04
● 5.2 ▲ 1.2
● 5.6 ▲ 1.2
● % AQCR TOTAL
▲ % VW TOTAL U.S.

Figure 2-11. Volkswagen 1971 Registrations

for 1972, although preliminary (but incomplete) totals have been published by the Department of Commerce (Ref. 2-6) based on data from R. L. Polk. This information is displayed graphically in Figure 2-12, where it will be noted that over 75 percent of the increase between 1969 and 1970 was attributable to Datsun, Toyota, and Volkswagen.

2.2 AIR QUALITY DATA AND EFFECTS

2.2.1 Introduction

The purpose of this portion of the study was to estimate the effect of delaying the implementation of the 1975 Federal auto emission standards for one year (1974 standards continuing in effect) on the air quality of 20 metropolitan areas at the end of 1975. Attention was focused on

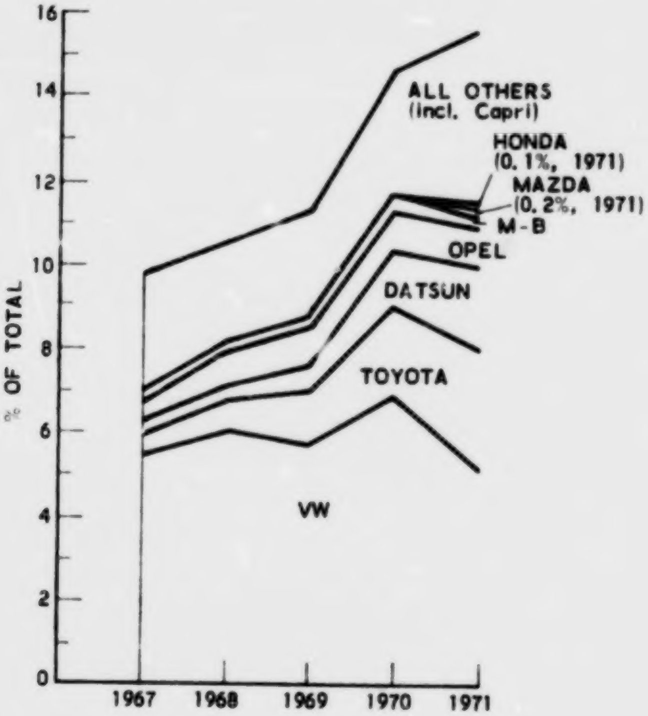

Figure 2-12. U.S. Imported New Car Registrations
Percent of Total New Car Registrations

carbon monoxide (CO) and photochemical oxidants (O_x), since these are the air quality factors that would be affected by the 1975 standards. While it is true that the auto emission standards regulate hydrocarbons (HC) rather than oxidants, the latter were calculated for several reasons. Hydrocarbons do influence oxidant concentrations, although the functional relationship is uncertain; this question will be examined later. In addition, a minimum of hydrocarbon monitoring data are available and, also, a reduction in the hydrocarbon emissions sufficient to allow photochemical oxidants to meet air quality standards is deemed sufficient even if the specified hydrocarbon standard has not been reached (Ref. 2-7). Only the 1975 Federal auto emission standards were considered; no allowance was made for retrofit, transportation strategies, etc.

Air quality data were taken either directly from the state implementation plans or the TRW/GCA study of fourteen metropolitan areas (see, for example, Ref. 2-8). The significance and uncertainty of such data are discussed in the final paragraph of this section. Maximum 8-hour averaged concentrations were found for various dates in the 1968 to 1972 time period, depending upon location; they were reduced to a common 1970 baseline by the same techniques used to estimate 1975 concentrations.

The following sections describe the computational procedures for the CO and O_x concentrations and some of the factors that affect the accuracy and significance of the results.

2.2.2 CO Calculations

All CO concentrations were assumed to be due to mobile source emissions. This is an approximate but not unreasonable assumption, since emission inventory data indicate that vehicles in metropolitan areas contribute over 80 percent, and in many cases over 90 percent, of the CO measured. However, light-duty vehicles (<6000-lb gross weight) must be separated since their relative CO contributions will change over the time period of interest. Based upon registration data for these vehicles in the late 1960s, it was calculated that 86.5 percent of the vehicles were light duty and 13.5 percent were heavy duty. It was also apparent from the data that the number of heavy-duty vehicles was increasing at a rate of approximately 5.5 percent per year, whereas there was much less change in the number of light-duty vehicles.

The remaining piece of needed data was the change in vehicle CO emissions with time. Use was made of data in Ref. 2-9 (specifically Fig. 2.7) which shows the fractional change in CO emissions from 1960 on, and the effect of various options for implementation of emission standards. The data were derived from a computer model for automotive emissions in a typical urban area, accounting for such factors as vehicle age distribution, vehicle mileage as a function of age, deterioration of emission controls with mileage, etc. The emissions were normalized against a maximum value; since only ratios were used in the calculations, absolute numbers were not needed. The factors for the years of interest are:

1968	0.97
1969	0.92
1970	0.86
1971	0.78
1975	0.51 (with 1975 Federal standards)
1975	0.58 (one-year delay in 1975 standards)

These data accounted for the light-duty vehicle emissions only. For the heavy-duty vehicles, it was noted in Table 13 of Ref. 2-10 that CO emissions are essentially constant at 130 to 140 gm/mi over the entire period of interest. Therefore, the only change for these vehicles would be due to the 5.5 percent yearly growth factor assumed.

A typical calculation for the San Francisco area will illustrate the use of the above data.

1970: 13 ppm CO, maximum 8-hour concentration
1975 estimate with 1975 Federal car standards:

$$CO_{ppm} = (1970\ CO)\ (\%\ LDV)\left(\frac{1975\ \text{emission factor}}{1970\ \text{emission factor}}\right) + (1970\ CO)\ (\%\ HDV)$$

$$(1 + \text{growth factor/year} \times \text{no. years})$$

$$= (13)\ (0.865)\left(\frac{0.51}{0.86}\right) + (13)\ (0.135)\ (1 + 0.055 \times 5)$$

$$= 8.9$$

1975 estimate with one-year delay in 1975 Federal standards:

$$CO_{ppm} = (13)\ (0.865)\left(\frac{0.58}{0.86}\right) + (13)\ (0.135)\ (1 + 0.055 \times 5)$$

$$= 9.8$$

Therefore, the improvement in CO air quality due to imposing 1975 standards without a delay is 0.9 ppm. A similar procedure was used to convert measured values for years other than 1970 to the 1970 baseline, and to compute 1975 concentrations for all cities other than Denver and Salt Lake City. The latter are classified as "high-altitude cities" (above 3500 ft) and require an additional correction factor. This correction was calculated from data in Ref. 2-10, giving emission factors for high and low altitude cities as a function of vehicle model year, summarized in Table 2-6, also the fraction of total miles driven by each model year. The procedure is illustrated for the case of light-duty vehicles with no delay in 1975 standards:

For 1970

Model Year	Fraction of Total Miles		Emissions per Mile at High Alt. Divided by Emissions per Mile at Low Alt.	Product
1970	0.088	×	2.0	0.176
1969	0.174	×	1.2	0.209
1968	0.135	×	1.6	0.216
pre- 1968	0.603	×	1.5	0.905
				$\Sigma =$ 1.506

For 1975

Model Year	Fraction of Total Miles		Emissions per Mile at High Alt. Divided by Emissions per Mile at Low Alt.	Product
1975	0.088	×	1.0	0.088
1974	0.174	×	2.2	0.383
1973	0.135	×	2.2	0.297
1972	0.103	×	2.2	0.227
1971	0.115	×	2.2	0.253
1970	0.097	×	2.0	0.194
1969	0.083	×	1.2	0.100
1968	0.060	×	1.6	0.096
pre- 1968	0.145	×	1.5	0.218
				$\Sigma = 1.856$

Table 2-6. Effect of Altitude on Automobile Emissions
Colorado

MODEL YEAR	EMISSION RATIO*	
	CO	HC
PRE-1968	1.5	1.1
1968	1.6	1.3
1969	1.2	1.2
1970	2.0	1.7
1971	2.2	1.8
1972	2.2	1.8
1973	2.2	1.8
1974	2.2	1.8
1975	1.0	1.0

*Emissions per mile at high altitude divided by emissions per mile at sea level

The multiplying factor for light-duty vehicles to account for high-altitude effects is then $\frac{1.856}{1.506}$ or 1.23. Note that the high-altitude to low-altitude emission factor for 1975 is 1.00, which assumes that all vehicles meet the 1975 standards. To calculate the correction factor for a 1-year delay, the 1974 ratio of 2.21 was used for 1975. Similar calculations were made for heavy-duty vehicles, but the correction was so close to 1 that the effect was insignificant. The results are presented in Table 2-7 for all the cities and ranked in Table 2-8 by the amount of improvement in air quality resulting from the imposition of 1975 standards on time. Note that the Southern Louisiana and Southeast Texas "city" represents primarily the New Orleans area.

2.2.3 Oxidant Calculations

The basic assumption made in calculating the 1975 oxidant levels was that oxidant concentration is directly proportional to HC

Table 2-7. Air Quality Benefits - CO
(by Air Quality Control Region)

CITY	1970 CO ppm MAX*	1975 CO 1-yr DELAY** ppm*	1975 CO NO DELAY ppm*	CO REDUCTION NO DELAY ppm*
LOS ANGELES	41.0	31.0	28.1	2.9
SAN FRANCISCO	13.0	9.8	8.9	0.9
SAN DIEGO	16.0	12.1	11.0	1.1
SACRAMENTO	22.0	16.6	15.1	1.5
HOUSTON	NO PROBLEM	--	--	--
PHOENIX TUCSON	39.0	29.7	27.0	2.7
S. LA. AND SE TEXAS	NO PROBLEM	--	--	--
BOSTON	22.4	16.9	15.3	1.6
PHILADELPHIA	21.8	16.3	14.8	1.5
PORTLAND	22.5	17.0	15.4	1.6
FAIRBANKS	32.2	24.3	22.1	2.2
BALTIMORE	20.6	15.6	14.1	1.5
N.Y.C. AREA	45.0	34.0	30.8	3.2
SPOKANE	19.4	14.5	13.2	1.3
DENVER	11.0	10.6	8.8	1.8
WASHINGTON, D.C.	23.5	18.0	16.4	1.6
PITTSBURGH	24.2	18.3	16.6	1.7
SEATTLE	20.0	15.1	13.7	1.4
MINNEAPOLIS ST. PAUL	20.1	15.0	13.6	1.4
SALT LAKE CITY	19.5	18.2	15.3	2.9

*All concentrations averaged over 8 hr

**Federal car program only. No retrofit, transportation strategies, etc, and at end of 1975 production

Table 2-8. Cities with Greatest Air Quality Movement -- No Delay*

RANK	CITY	IMPROVEMENT IN CO, ppm 1975 vs 1974 STD
1	N.Y.C. AREA	3.2
2	LOS ANGELES	2.9
	SALT LAKE CITY	2.9
3	PHOENIX/TUCSON	2.7
4	FAIRBANKS	2.2
5	DENVER	1.8
6	PITTSBURGH	1.7
7	BOSTON	1.6
	PORTLAND	1.6
	WASHINGTON, D.C.	1.6
8	SACRAMENTO	1.5
	BALTIMORE	1.5
	PHILADELPHIA	1.5
9	SEATTLE	1.4
	MINNEAPOLIS/ ST. PAUL	1.4
10	SPOKANE	1.3
11	SAN DIEGO	1.1
12	SAN FRANCISCO	0.9

*No delay in implementing 1975 emission standards

RANK	CITY	IMPROVEMENT IN OXIDANT, ppm 1975 vs 1974 STD
1	LOS ANGELES	0.022
2	SAN DIEGO	0.015
3	SAN FRANCISCO	0.008
	BALTIMORE	0.008
4	SACRAMENTO	0.007
	DENVER	0.007
	WASHINGTON, D.C.	0.007
5	N.Y.C. AREA	0.006
	PITTSBURGH	0.006
6	BOSTON	0.005
7	HOUSTON	0.004
	PHOENIX/TUCSON	0.004
	PORTLAND	0.004
8	S. LA. AND SE TEXAS	0.001

concentration. Although this relationship is open to serious question, as will be discussed later, it is very commonly employed and probably satisfactory for purposes of this study.

The computational procedure based on the above assumption differed somewhat from that for CO. Unlike the latter, emissions of HC are not so predominantly from mobile sources and, in addition, show a considerable variation in the mobile source contribution with locality. Of course, the significance of distinguishing the source of HC lies in the fact that it is the effect of 1975 auto standards that is of interest. The division of HC emissions was estimated from emission inventories, and the assumption was made that stationary source emissions would not decrease appreciably in the 1970/75 period. The projected emissions for autos were again based upon data in Ref. 2-9 showing the effect of varying the time for implementing standards on HC emissions. The factors used in the calculations were:

1969	0.82
1970	0.76
1971	0.70
1972	0.64
1975	0.38 (with 1975 Federal standards)
1975	0.42 (1-year delay in 1975 standards)

For heavy-duty vehicles, data in Ref. 2-10 indicated little expected decrease in HC emissions to 1975; therefore, as in the case of CO, only the growth factor of 5.5 percent per year changed the contribution of these vehicles.

The following is a typical O_x calculation for the San Francisco area.

1970: 0.30 ppm O_x, maximum 1-hour concentration
mobile contribution: 59 percent or 0.177 ppm
1975 estimate with 1975 Federal car standards:

$$
\begin{aligned}
O_{x\text{ ppm}} &= (1970\text{ stationary }O_x) + (1970\text{ mobile }O_x)\Big[(\%\text{ LDV}) \\
&\quad \left(\frac{1975\text{ emission factor}}{1970\text{ emission factor}}\right) + (\%\text{ HDV})\,(1 + \text{growth factor/year} \\
&\quad \times\text{ no. years})\Big] \\
&= 0.123 + (0.177)\left[(0.865)\left(\frac{0.38}{0.76}\right) + (0.135)\,(1 + 0.055 \times 5)\right] \\
&= 0.229
\end{aligned}
$$

1975 estimate with 1-year delay in 1975 Federal car standards:

$$
\begin{aligned}
O_{x\text{ ppm}} &= 0.123 + (0.177)\left[(0.865)\left(\frac{0.42}{0.76}\right) + (0.135)\,(1.275)\right] \\
&= 0.237
\end{aligned}
$$

Therefore, the improvement in O_x concentration due to imposing the 1975 standards on time is 0.008 ppm. Results for all cities are given in Table 2-9, and the ranking in Table 2-8. Only Denver required calculation of an altitude-correction factor; the procedure was similar to the CO case.

Table 2-9. Air Quality Benefits - Oxidant
(by Air Quality Control Region)

CITY	1970 OX ppm MAX*	PERCENT MOBILE HC**	1975 OX 1-yr DELAY*** ppm*	1975 OX NO DELAY ppm*	OX REDUCTION NO DELAY ppm*
LOS ANGELES	0.67	71	0.501	0.479	0.022
SAN FRANCISCO	0.30	59	0.237	0.229	0.008
SAN DIEGO	0.40	84	0.280	0.265	0.015
SACRAMENTO	0.24	60	0.189	0.182	0.007
HOUSTON	0.324	22	0.296	0.292	0.004
PHOENIX/TUCSON	0.145	60	0.114	0.110	0.004
S. LA. AND SE TEXAS	0.13	24	0.119	0.118	0.001
BOSTON	0.211	44	0.176	0.171	0.005
PHILADELPHIA	NO PROBLEM	--	--	--	--
PORTLAND	0.14	66	0.107	0.103	0.004
FAIRBANKS	NO PROBLEM	--	--	--	--
BALTIMORE	0.26	64	0.201	0.193	0.008
N.Y.C. AREA	0.18	69	0.136	0.130	0.006
SPOKANE	NO PROBLEM	--	--	--	--
DENVER	0.13	66	0.113	0.106	0.007
WASHINGTON, D.C.	0.16	88	0.110	0.103	0.007
PITTSBURGH	0.17	77	0.123	0.117	0.006
SEATTLE	NO PROBLEM	--	--	--	--
MINNEAPOLIS/ST. PAUL	NO PROBLEM	--	--	--	--
SALT LAKE CITY	NO PROBLEM	--	--	--	--

*All concentrations averaged over 1 hr
**Includes heavy duty vehicles
***Federal car program only. No retrofit, transportation strategies, etc, and at end of 1975 production

2.2.4 Significance of Results

There is no dramatic improvement in the air quality in the control regions with catalyst-equipped cars during the one-year period examined. They would have an approximately 10-percent reduction in CO and approximately 5-percent reduction in oxidant level beyond that level resulting if only 1974 emission standards were in effect throughout the 1975 model year.

The results of these calculations should be evaluated with due consideration to the quality of measured CO and O_x concentrations and the assumptions in projection methodology. Some of the factors that affect the accuracy, or at least the significance, of the measured data are location and elevation of the surveillance equipment, vagaries of weather, traffic flow, and congestion. A baseline year may not be representative of average conditions. In addition, high concentrations of pollutants such as CO, occur very locally, as illustrated in Figure 2-13 for the Denver area. Therefore, optimal control may not mean control of the entire air basin.

Regarding the extrapolated calculations to 1975, several inherent inaccuracies are apparent, and their effects should be evaluated when more complete data are available. For example, the emission factors from Ref. 2-9 were based on national averages for vehicle age distributions, miles driven per year, etc. They did not take into account local variations. Another consideration is the assumption of a direct proportionality between HC emissions and oxidant level. Figure 2-14, taken from Ref. 2-8, shows data for the Houston area and, for comparison, a dashed line corresponding to the envelope for Los Angeles, Denver, Cincinnati, Philadelphia, and Washington. It is clear that there is little correlation of HC and oxidant concentrations. Since EPA does allow a simple proportional

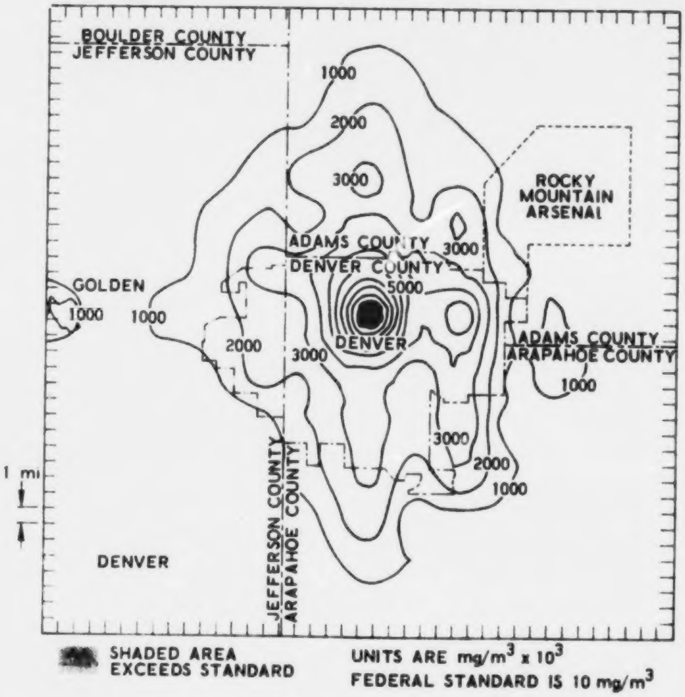
BOULDER COUNTY
JEFFERSON COUNTY
1000
2000
3000
ROCKY MOUNTAIN ARSENAL
ADAMS COUNTY
DENVER COUNTY
3000
5000
GOLDEN
1000
1000
2000
3000
DENVER
ADAMS COUNTY
ARAPAHOE COUNTY
1000
3000
2000
1000
1 mi
JEFFERSON COUNTY
ARAPAHOE COUNTY
DENVER
SHADED AREA EXCEEDS STANDARD
UNITS ARE mg/m³ x 10³
FEDERAL STANDARD IS 10 mg/m³

Figure 2-13. Example of High CO Being Confined to Small Area

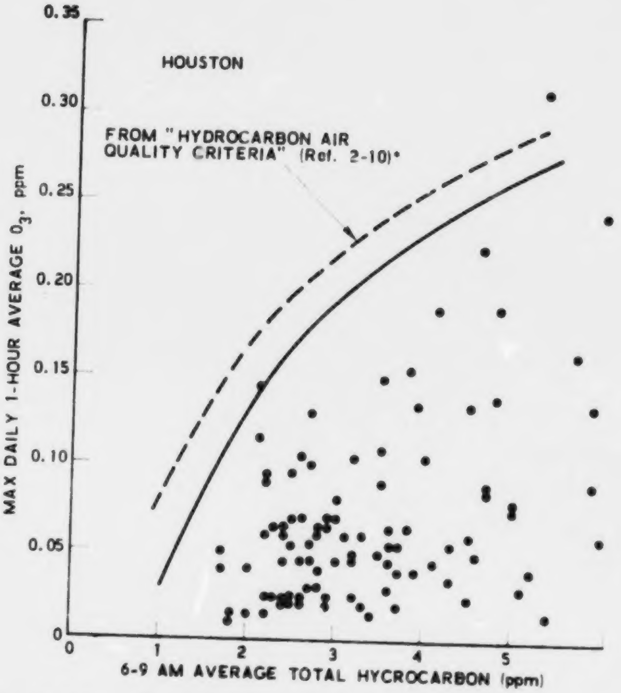

Figure 2-14. Example of Lack of Correlation between Hydrocarbons and Oxidant Concentrations

rollback of HC to reduce O_x levels, the relationship was used in this study for convenience. Finally, a possible source of large error could be the fact that CO emissions of catalyst-equipped cars may be very high at low vehicle speeds, due to insufficient mass flow to keep the catalyst temperature up to the value necessary for good efficiency. For example, the speed correction factor recommended in Ref. 2-10 is reproduced in Figure 2-15. It is normalized to a value of 1.0 at a speed of 19.6 miles per hour used in the 1975 Federal Test Procedure. Actual New York City test data, shown in Figure 2-16, indicate that emissions from catalyst-equipped cars have a substantially different variation with speed, rising sharply in the idling and stop-and-go speed range. Maximum CO concentrations in urban areas occur as a result of bad traffic-jam situations, not 19.6 mile-per-hour driving. These effects are not accounted for in the methodology of Ref. 2-10. Similar potential effects of high altitude and low ambient temperature on catalysts are also not accounted for.

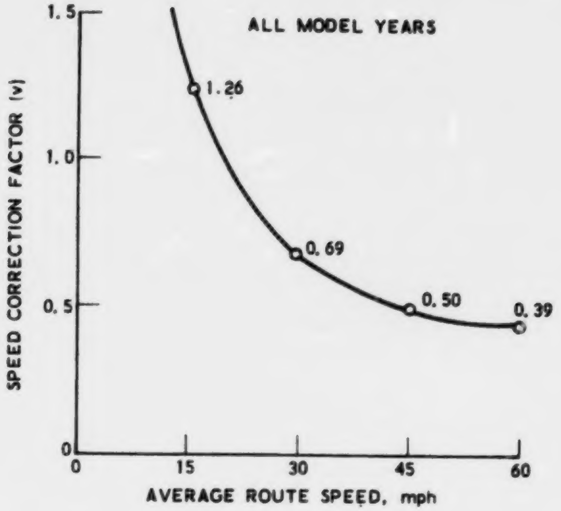

Figure 2-15. Average Speed Correction Factor, Carbon Monoxide (Ref. 2-10)

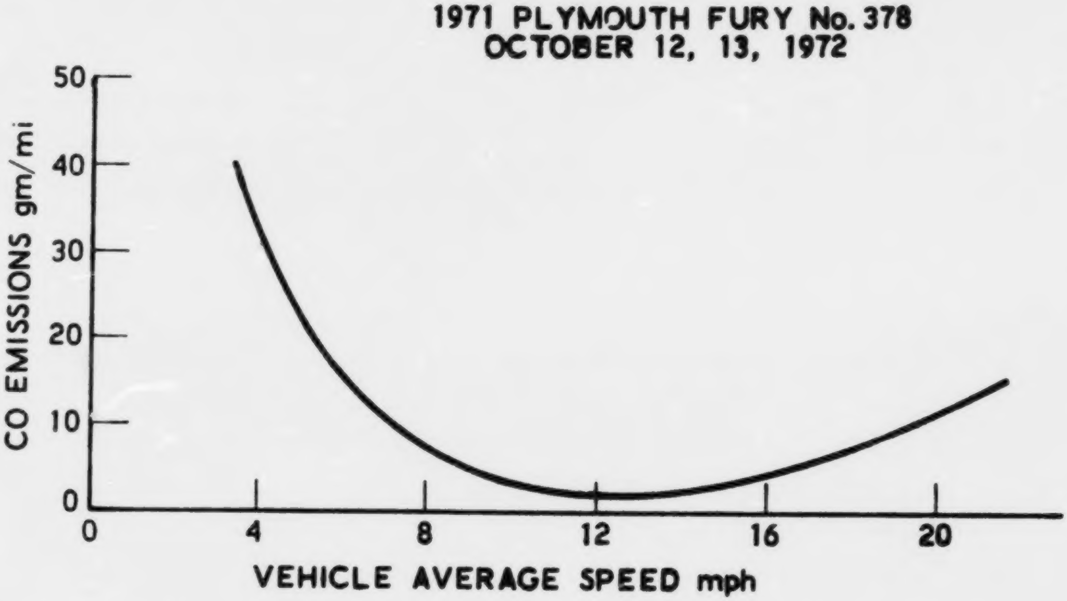

Figure 2-16. Emissions from a Catalyst - Equipped Automobile (Ref. 2-12)

2.3 AUTO MOVEMENT AND MIGRATION FACTORS

Both the daily auto travel into and out of AQCRs and the annual migration of autos into such a region may be important factors to be considered in a two-car strategy. These factors along with daily auto miles per capita are presented in Table 2-10. Daily auto travel across AQCR boundaries is shown relative to all auto trips within the AQCR and is labeled "% Trips External."

Table 2-10. Car Movement Summary

AIR QUALITY CONTROL REGION	DAILY CAR MILES PER CAPITA	% DAILY TRIPS EXTERNAL	% CAR IN MIGRATION*
CALIFORNIA	17.1	--	2.2
SOUTH COAST (L.A.)	15.0	0.67	2.5
HOUSTON	16.5	1.5	3.7
PHOENIX-TUCSON	13.5	2.7	5.1
SO. LOUIS-TEXAS	6.1	--	2.7
SAN FRANCISCO	13.8	1.7	3.0
BOSTON	11.1	8.5	2.3
SAN DIEGO	13.8	5.0	5.0
PHILADELPHIA	8.2	10.0	1.5
PORTLAND	8.2	9.0	4.0
SACRAMENTO	15.1	7.5	3.2
FAIRBANKS	--	--	--
BALTIMORE	9.5	<10.0	2.7
NEW YORK	7.4	5.0	2.5
SPOKANE	12.0	<9.0	5.4
DENVER	11.3	6.4	4.0
WASHINGTON	12.0	8.0	2.3
PITTSBURGH	8.8	<9.0	1.6
SEATTLE	13.5	7.0	5.0
MINNEAPOLIS-ST. PAUL	14.0	3.8	2.4
SALT LAKE CITY	15.8	8.5	5.1

*Out-of-state registrations

Information on the percentage of external trips and daily auto miles per capita was obtained for the most part from the many local area transportation studies conducted over the past 15 years (Refs. 2-14 through 2-34). Auto migration data are not kept by most states, so a procedure was developed based on the migration of people into AQCRs viz:

Annual Auto Migration = (Annual Persons-in-Migration)

× (Ratios of Autos Per Person in the United States = 0.405)

Annual persons-in-migration to AQCRs can be obtained from a report published by the Bureau of the Census on "Migration Between State Economic Areas." (Ref. 2-34) Some adjustment of the data in this report is required:

a. The report provides data on the migration of individuals 5 years of age or over. The ratio of total population to population 5 years of age or older was used to account for migration of individuals younger than 5 years of age.

b. The report shows a significant number of people for whom it is not possible to determine whether they are immigrants or not. It was assumed that the fraction of these individuals who are immigrants is equal to the ratio of known immigrants to the total population.

The following is a typical calculation for California, which happens to be one of the few states that keeps data on auto immigration. The computed value of 205,000 autos per year coming into the state is quite close to the actual number reported, which is 211,850.

a. The total number of people aged 5 and over coming into California for 1965 to 1970 is = 1.689 m from out of state + 0.47 m from out of the country + 1.034 m unknown. Population 5 or over = 18.3 m. Total immigrants = 1.689 + 0.47 + (1.689 + 0.47/18.3) (1.034 m)

Total Immigrants 5 or over = 2.28 m

b. Assume that the ratio of immigrants 5 or over to the total immigrants equals the ratio of population 5 or over to the total population.

$$\frac{2.28}{X} = \frac{18.3}{20.1}$$

Total immigration = 2.51 m in 5 years

c. Auto migration = 2.51/5 (0.405) = 205,000/year; actual = 211,850.

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SECTION 3

POTENTIAL COMPLIANCE ASSURANCE MEASURES

A number of approaches are possible to ensure compliance with a two-car strategy, including use of existing or modified car registration procedures, direct control of car dealers, car inspection, and required retrofit of higher-emission cars operating in controlled regions. These techniques/approaches are briefly discussed below. Additional comments regarding these potential measures are given in Section 4 (Auto Industry Considerations) and Section 5 (State or Regional Considerations).

3.1 VEHICLE REGISTRATION

Since all states require annual registration of new and used cars, a preregistration requirement that purchasers of new cars to be used in controlled regions show compliance appears relatively straightforward. Unfortunately, existing registration procedures in most states are not capable of being used without modification. In particular:

a. Very little effort is made to ensure that all cars are in fact registered, nor are penalties for late registrations severe. Enforcement is primarily through normal police or highway patrol traffic activities, such as stopping cars for speeding and reckless driving and in reporting and investigating accidents.

b. Although all states require an address for car registration none is able to verify that such an address exists, and an applicant's legal address is not required. For purposes of car registration a mailing address, post office box, second home, or business address are all valid.

c. Only California requires that emission control compliance (Equipment Installation Verification) be shown prior to registration. In general, compliance requirements for new cars would be those specified by EPA for the region where the car was sold. Unfortunately, once a new car is registered in another state, it becomes a "used" car. Individuals may therefore evade any new car preregistration emission control regulations by registering a new car in a noncontrolled adjoining state and bring the car into a controlled area for permanent residence.

To use existing state car registration procedures for ensuring compliance with a two-car strategy, expansion of state enforcement capabilities would be required. In addition, new Federal regulations would be required to prevent out-of-state new car sales and registration.

3.2 DEALER CONTROL

In this approach new car dealers would be required to verify that all new cars being sold are properly equipped for the region in which they will be operated. In particular, they must verify that residents of controlled regions are provided with low-emission cars.

Dealers might verify which car to sell through determination of a purchaser's legal address using such information as driver's licence, place of employment, IRS address, etc. Further, if the dealers in controlled areas were provided only with low-emission cars, this approach could make it difficult to evade the two-car strategy. In California, all new cars presently come equipped with the "California Package," and dealers are not permitted to sell new cars unless this package of equipment is operating at the time of sale.

Difficulties with this approach are:

a. Most dealers are poorly equipped to determine their customer's legal residence or the primary area in which the car would be used

b. New legislation with strong enforcement provisions would be required to ensure dealer compliance

c. Fleet-car buyers who normally purchase and register in one area for use in another might be required to purchase and register locally.

3.3 VEHICLE INSPECTION

All new cars in a given controlled region might be inspected periodically to ensure that they have proper emission control devices.

Inspection with certification could be required as a prerequisite for annual car registration. Such an inspection program would require new legislation and additional funding in all states except New Jersey. In addition, modifications in registration procedures would be required.

3.4 VEHICLE RETROFIT

A program might be established to require that all 1975 higher-emission cars entering a controlled region be retrofitted to meet the region's emission standards prior to registration. New state legislation would be required to make retrofit mandatory and a prerequisite for registration. The experience of California in setting standards, testing retrofit devices, and obtaining legislative action indicates that it would take at least two years after the introduction of 1975 cars to implement a retrofit program.

3.5 MEASURES REQUIRED OUTSIDE CONTROL REGION

There are strong indications that higher-emission 1975 cars may cost significantly less than new cars required in controlled regions. Higher car costs combined with the fact that many noncontrolled regions may have lower taxes or fees, and that new car dealers in controlled regions can legally make agreements with their counterparts outside such regions to send customers in return for a "finder's fee," indicates that evasion of two-car strategy restrictions may be widespread. Oregon, which borders on California, for example, has low registration fees and no sales tax. This obviously provides incentives for out-of-state new car buyers. A number of potential control regions are interstate, with each state having different sales and local taxes, all within easy driving distances of noncontrolled areas.

Therefore if the two-car strategy is to be completely successful, certain controls are needed over car registrations and sales outside these control regions. In particular, nonresidents of states outside controlled regions should not be permitted to register higher-emission cars unless they can show that the principal use of the car would be within that state, and sales of such higher-emission cars should be prohibited to residents of controlled regions.

In addition, catalyst-equipped low-emission cars will require unleaded gasoline. Therefore, unleaded gasoline should be available both inside and outside of controlled regions, if residents of such regions are to be able to use their cars freely on trips to other parts of the country.

3.6 SUMMARY

A number of procedures are possible for ensuring successful implementation of a two-car strategy, including tying compliance to car registration, providing compliance through controls over new car dealers, and enforcing compliance through car inspection and retrofit programs. However, if 100 percent compliance is required, implementation of these procedures will call for additional state legislation, new Federal regulations, and expansion of state enforcement agencies.

SECTION 4

AUTO INDUSTRY CONSIDERATIONS

In this section of the report, the feasibility of various aspects of two-car control strategy is examined from the viewpoint of the auto industry.[1] First, a general discussion is presented which summarizes auto industry comments/reactions to preselected issue discussion topics. Next, more detailed comments/reactions are presented based on discussions held with the major domestic auto manufacturers. Finally, a brief summary of auto industry considerations is presented. Unless otherwise referenced, all information presented in this section is based on discussions or correspondence with each respective auto company, as noted in Section 1.2, except for the Chrysler comments abstracted from testimony presented in the March 1973 Suspension Request Rehearings.[2]

4.1 GENERAL DISCUSSION

All auto companies contacted[3] stressed their inability to meet 1975 Federal emission standards. Therefore, all discussions held with the auto companies concerning two-car strategy were predicated on the low-emission vehicle being their "best-effort" with a catalyst-equipped car (whether or not it met 1975 emission standard levels) and the higher-emission (non catalyst) car meeting 1973/74 Federal standards.

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[1] Estimates of car sales in this section are those made by the individual manufacturer and may not agree with values in Section 2, which are based on R. L. Polk and Company registration data.

[2] Those hearings held on remand from the United States Court of Appeals for the District of Columbia Circuit relative to applications for suspension of the 1975 motor vehicle exhaust emission standards.

[3] Except Honda (for prechamber-equipped Civic car), Mercedes Benz (for diesel), and Toyo Kogyo (for rotary engine).

4.1.1 General Attitude Toward/About Two-Car Strategies

4.1.1.1 General Motors

General Motors had originally (prior to March 1973 Suspension Request Rehearings) advocated a two-car strategy wherein the lesser-emitting car did not meet 1975 emission standards and might not incorporate a catalyst. The benefits of their approach were economic in nature, and they had estimated an approximate 50/50 split in production of the two types.

General Motors now strongly advocates a California-only strategy wherein the low-emission car does include a catalyst but meets emission standards higher than the Federal 1975 levels, as follows (with averaging):

- o HC = 0.76 gm/mi
- o CO = 5.7 gm/mi
- o NO_x = 3.1 gm/mi

Under this approach, General Motors' production of the catalyst-equipped car would be quite limited (approximately 7 percent of their total sales are in California). They feel that extending the two-car strategy to areas other than California would increase manufacturing and distribution problems and involve a complex and difficult enforcement system.

4.1.1.2 Ford

Ford advocates a California-only two-car strategy with the low-emission cars catalyst equipped (although not meeting 1975 standards). Ford feels that expansion of the two-car strategy beyond California to include a multiplicity of cities and/or regions is incalculably complex and difficult to administer. Such an approach, to them, would be highly disruptive of normal channels of distribution, sales, and enforcement.

4.1.1.3 American Motors

American Motors also advocates the California-only strategy (with catalyst), as in the case of Ford. They feel that extending the strategy to other areas would make it very difficult for American Motors to comply, due to their limited assembly and marketing facilities.

4.1.1.4 International Harvester

International Harvester feels they could handle the California-only strategy, as they have done in the past with California-unique systems. However, if a California-plus strategy were adopted, the additional areas would have to be large geographically since the approach gets less feasible as the areas get smaller in size.

4.1.1.5 Volkswagen

Volkswagen is not in favor of a two-car strategy of any type as they feel they are not ready for catalysts in 1975 (perhaps by the end of 1975). They prefer a one-year extension to enable further catalyst fleet tests. Even in this case, California would not be their preferred location for fleet testing.

4.1.1.6 Toyota

Toyota favors a phasing-in process for catalyst-equipped cars, which is not provided by the two-car strategy. In the case of the California-only strategy, Toyota feels that California is too big to represent a mere test sample (about 25 percent of all Toyota U.S. sales are in California). However, Toyota California sales represent only ~4.67% of their total passenger car output. Their preference might be to equip one model only with a catalyst for California sales.

4.1.1.7 Mercedes Benz

The two-car strategy has little benefit for Mercedes Benz, because 70 to 80 percent of their United States cars are sold in metropolitan areas. They feel that because of the additional burden of dealership inventory--problems of enforcement of distribution by regulation, inspection procedures, training, and other related matters--the disadvantages of a two-car strategy far outweigh any possible benefits. They have only 8 zone offices to handle all U.S. distribution. (The San Francisco office also handles Washington and Oregon; the Los Angeles office also handles Arizona and Nevada).

Six thousand diesel-equipped cars were sold in the U.S. last year: 25 percent of all Mercedes Benz cars are shipped to California zones; 15 percent of this goes to adjoining states. They expect to sell only 36,000 to 37,000 1973 model year cars in the U.S. Their overall feeling is that it would be beneficial to have a one-car strategy, with that car having the lowest emissions possible.

4.1.1.8 Nissan (Datsun)

Nissan does not like a two-car strategy. They would prefer a suspension of the 1975 standards which would allow each automaker to introduce a low-emission car (e.g., in California) on its own initiative to get field test information. If promulgated, they would try to comply with a California-only, two-car strategy, but they foresee many problems. Approximately 30 percent of Nissan's United States sales are in California, and this percentage is too large for a "test case." However, Nissan's California sales represent only ~ 5.01% of their total passenger car output. Their California regional offices also includes Arizona and Nevada sales, and this may be difficult to manage; they may not have enough lead time to get two types of cars on the assembly line.

With regard to the California-plus strategy, Nissan does not like the option of controlling additional metropolitan areas at all. They feel the problems associated with it would be too big to imagine.

4.1.1.9 Chrysler

Chrysler does not feel that catalysts are sufficiently well developed for use, even in a limited area such as California. However, if a California-only strategy were implemented, they would not forego the California market despite their feeling about catalysts.

Chrysler prefers to use the extra year (of emission standards suspension) to continue fleet testing development. Then, a California-only strategy might be a proper next step.

4.1.2 Ability to Produce Two Classes of New Cars

In general, there is no question but that the auto industry has the capability to produce two classes of cars. However, there does appear to be a degree of difficulty which varies with the size of the auto maker, i.e., the larger the company, the easier it is to add options.

For example, General Motors states there is no real obstacle to two-car production but that there are added problems and costs inherent in the production and assembly operations. In their view, the California-plus strategy option would require converting additional plants to two-car assembly and/or cross-shipping of cars at additional expense to the public. Ford feels that the number of states involved has a big impact on two-car feasibility. Whereas the California-only strategy would not pose a problem, the California-plus strategy would involve more plants and considerably more complexity (the extent varying with each car line mix and plant location). In the same vein, American Motors feels that extending the two-car strategy to the California-plus option could make it difficult for them to comply due to their limited assembly facility locations. On the other hand, International Harvester, having a preponderance of special-equipment orders, feels that they can produce effectively as long as no more than two vehicle classes are involved.

4.1.3 Ability to Market New Cars

Again, there is generally no question but that the auto industry has the capability to market two classes of new cars. However, there are a number of factors associated with implementing a two-car strategy in 1975. These include the impact of the number of regions controlled, the impact of car pricing policy, warranty interpretations, and problems peculiar to foregin car makers.

General Motors feels that their current network of assembly plants and zone offices is adequate for the California-only strategy (affecting about 7 percent of their national sales) and, although the California-plus strategy is not an impossible task, it would be very difficult for them to provide a full new-car model mix for all the various cities involved. They feel that a major consideration, in either case, is the car-pricing problem. Their experience with California emission control systems in the 1966/72 time period suggests that the additional hardware and costs of the low-emission car should be handled as a "mandatory option."

Ford also feels that the California-only strategy may not be too bad logistically (representing about 10 percent of their national sales). On the other hand, they feel that a California-plus strategy could be highly disruptive of their distribution and sales channels, although they do not know which additional states or regions would be tolerable or intolerable. Ford has not yet determined their two-car pricing policy (e.g., adding increased costs only to low-emission cars or spreading them over all new cars), but they do state that new car warranties would be interpreted the same as now : i.e., replacement of defective parts, no performance warranty.

American Motors feels they can market under a California-only strategy but that their limited marketing facilities would make a California-plus strategy less feasible as additional areas were added.

International Harvester feels that the California-only strategy is satisfactory but states they could have marketing problems with a California-plus strategy unless added areas were large in geographic size; their cars are shipped to only six inventory places after manufacture.

Nissan states that even with a California-only strategy their marketing would be adversely affected, since they normally have 30 percent of their total U.S. sales in California.

Mercedes Benz distributes their cars through seven vehicle preparation centers and eight zone offices. They foresee considerable distribution and logistics problems with the two-car strategy under their setup. Because of the required lead time for shipment from Europe, keeping an inventory commensurate with market demand is complex enough with a one-car concept. The two-car strategy would simply add the burden of dealership inventories in both car classes.

Toyota prefers a California-only strategy to a California-plus strategy. Although the California-only sample is much larger than desirable (about 25 percent of total Toyota U.S. sales are in California), it would be handled through their two existing California distribution centers.

4.1.4 Ability to Service Two Vehicle Classes

As in the case of production and marketing, there is general agreement that two classes of vehicles can be serviced. The degree and adequacy of service is impacted by the number of regions controlled, with the feeling that service for low-emission cars will certainly be less adequate outside the control region than inside the control region.

Under a California-only strategy, existing California warehouses can supply service parts for the low-emission car. Servicing and training would be easier to implement and control in a single state; expedited service could be utilized to provide faster customer response. For the case of California vehicles becoming inoperative when out of state, the auto companies might have to rely on air-shipping of special parts (e.g., catalytic converters, etc.), where 24-hour delivery is now standard U.S. practice. Also, the training of servicemen in areas outside California would be minimal.

Under a California-plus strategy, the distribution requirements for service in additional areas adds greatly to the complexity. Parts would need to be available on almost a nationwide basis, and any special servicing equipment would be required in all dealerships. Furthermore, a nationwide training program would have to be implemented.

4.1.5 Vehicle Identification, by Control System Type

All states utilize the vehicle identification number (VIN), or some portion therefore, for vehicle registration purposes. The VIN identifies:

- Model year
- Assembly plant

- Body type
- Engine class
- Production serial number.

The various auto companies use a different number of digits in their VIN s (e.g., General Motors uses 13 digits; Ford uses 11 digits). The VIN does not currently identify the type of emission control system used on the car. Certification tags on underhood panels and window stickers are used for this purpose.

There may be a way to add a digit or redesignate the VIN to show control system type (e.g., by groupings of manufacturing sequence numbers). However, adding a digit may be a problem since some states can only pick up a limited number of characters on their reading equipment.

In any event, changing the VIN system would involve extra costs and efforts that may be unwarranted for a one-year, two-car strategy. Ford, for example, objects strongly to adding digits to the VIN. All their historical data banks are keyed to the existing VIN system, and it would be disruptive and costly to rebuild computer programs and refit stamping and body machines. Ford could produce an "after-the-fact" machine-processible record (tape) of cars produced by control system type. This would not be part of the VIN system but could aid in vehicle control system identification.

The Society of Automotive Engineers (SAE) is currently trying to standardize VIN systems to help simplify auto registration problems in general. However, General Motors feels that a "use sticker" would be required for a two-car strategy anyway, in addition to registration control. If this were so, it would certainly deemphasize any efforts to change VIN methods for emission control system identification.

4.1.6 Dealer Delivery Control

In general, deliveries of new cars to dealers are made on the basis of physical order forms sent by the dealer to the auto company. In some cases the ultimate purchaser has given his address to the dealer (not necessarily his legal residence), but usually the purchaser's address is not included on the order form sent to the auto company.

The auto companies stress that they lack effective techniques for exercising control over dealers. Even if they had contractual authority to do so, there is no uniformity in contract requirements because of varying state laws affecting the allowable degree of control. They thus feel that they may not be able to keep a dealer from ordering cars to be sold outside a given control region. There are also problems of a mechanical nature, such as simple errors occurring in the order blank.

Some limited control techniques are in use. Most companies visually inspect the order form at the sales district level to see if the proper emissions package has been ordered (based on point of delivery). General Motors, on the other hand, scans the order by computer and automatically adds the California emissions package when the order is from a California dealer.

Other dealer control problems were cited. Dealer-to-dealer trading is one of them. Large trading percentages in a given area are common. For example, it was estimated that 50 percent of the new cars in the Detroit metropolitan area were involved in dealer trades prior to ultimate sale to the purchaser.

Fleet car sales is another problem (e.g., purchases by Hertz, National, etc.). These companies purchase cars in one state for delivery in another. In 1972, General Motors had 500,000 fleet car sales.

"Border" dealers with split sales districts (e.g., dealers located on the California border selling to both California and Arizona residents) pose still another problem, since their location enables them to sell in more than one state.

Aside from fleet sales, per se, many dealers order cars for delivery to other dealers in other states. Ford estimates that 10 percent of their factory orders by dealers are for delivery to other dealers (including fleet car sales).

4.1.7 Requirement for Retrofit of Lesser-Controlled Cars

All responding auto companies are in general agreement that any requirement to retrofit a 1975 car from the lesser degree of emission control to the low-emission vehicle configuration and standards is a very severe one. It may be physically possible but economically impractical to do so. For example, it may be possible to add a catalyst but would be much more difficult to change other parts such as intake manifolds, air injection, controls, and cylinder heads. Air conditioners were mentioned as analogous in the retrofit sense. It was never practical to retrofit air conditioning systems to factory-installed configuration and performance levels. Add-on units were the only practical way of accomplishing air-conditioner retrofit.

It is conceivable that planning for retrofit could ease some of the problems. The auto companies would need to know of this requirement in advance, and it might force the decision to make cars nearly identical except for the catalytic converter itself. This situation, of course, might not be equitable to the buyer of a lesser-controlled car.

Also, required retrofit could increase certification problems, i.e., certifying the lesser-controlled car at 1974 emission levels, then certifying the retrofitted version at 1975 emission levels.

4.1.8 Unleaded Gasoline Requirements, Noncatalyst 1975 Models

A diversity of opinions was expressed in this area. American Motors feels that noncatalyst 1975 systems should still be required to use unleaded gasoline. Their experimental data indicate that use of unleaded gasoline:

a. Lowers NO levels (affected by deposits in EGR system[4])
b. Lowers HC levels (affected by valve deposits, valve seatings, etc.)

However, American Motors has not decided to equip noncatalyst 1975 cars with gasoline filler necks to "force" the use of unleaded gasoline.

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[4] Exhaust gas recirculation system.

General Motors states that they would "encourage" the use of unleaded gasoline for noncatalyst systems but that they would not make its use mandatory. Ford had no position on this issue.

4.2 DISCUSSION BY DOMESTIC AUTO COMPANY

4.2.1 General Motors

4.2.1.1 General Attitude Toward/About Two-Car Strategies

Prior to the March 1973 Suspension Request Rehearings, General Motors advocated implementation of a two-car strategy quite different from the basic strategy options examined in the present study. Under the General Motors plan (see Appendix D), Type "B" cars would be used where automotive pollution is a serious local problem, and Type "A" cars would be used in the rest of the nation. The choice of car use (Type "A" vs Type "B") would be decided by local governments. The emission levels proposed for the two cars were:

	Emissions, gm/mile	
	Type "A"	Type "B"
HC	3.0	1.0
CO	28.0	18.0
NO_x	3.1	1.5

The Type "B" car may or may not have a catalyst. A catalyst might be used to help improve driveability even though not required to meet Type "B" emission standards.

Under this type of system, General Motors estimated a 50/50 split between Type "A" and Type "B" cars. Principal argument for their approach was economic in nature. Their two-car system would be at least semipermanent in nature and result in a consumer savings of $14 billion over a decade (see Appendix D for details).

At that time, General Motors felt that a California-only, one-year, two-car strategy would not do too much toward changing or improving systems, although it would give an additional year for test purposes and would lessen the assembly-line impact. However, if a two-car strategy of any type were to be implemented, General Motors would expect to be able to participate as well as any other auto manufacturer. They felt that registration control was necessary to make the two-car strategy work effectively.

In response to questioning about current two-car strategies at the March 1973 Suspension Request Rehearings, General Motors reviewed their position and issued a formal response (see Appendix E). In summary, they feel that extending a strategy requiring catalyst-equipped cars in areas other than California increases manufacturing and distribution problems and involves a complex and difficult enforcement system. They feel that the California-only strategy is the proper way to go, but propose certification levels for California cars (with suggested changes, including averaging) as follows:

	Emissions, gm/mile
HC	0.76
CO	5.70
NO_x	3.10

Advantages cited by General Motors for the California-only strategy include:

a. The wide variety of climatic and road conditions in California

b. About 7 percent of General Motors' nationwide production is sold in California

c. A single geographic area provides across-the-board experience with several types and sizes of cars

d. Initial service parts distribution is limited to one area

e. Field service training can be more thoroughly evaluated

f. In the event of a need for recall or modification, all affected vehicles would be in one general area.

4.2.1.2 Ability to Produce Two Classes of New Cars

General Motors would not have a significant problem in producing two classes of cars, even for the option of California plus all AQCRs with serious automotive pollution (their preferred approach, prior to March 1973 Rehearings). Of course, under General Motors' originally proposed two-car approach, there could be a substantial "sameness" between Type "A" and Type "B" cars, except for the possible catalyst addition.

General Motors states, however, that the two-car approach would entail some problems and additional costs. With regard to production operations, two-car problem areas include:

- Material inventory
- Scheduling
- Handling
- Obsolescence
- Operator training
- Quality control
- Manpower productivity.

In the assembly operations area, additional problems and costs are foreseen with regard to hardware and to vehicle order and distribution requirements.

All General Motors' California cars are presently emission tested in the plants where they are assembled, as follows:

a. Steady-state idle HC and CO test as cars come off assembly line, ~1 minute per car (100 percent tested; California requires 75 percent).

b. Seven-mode hot test (2 minutes) for 25 percent of cars.

c. Audit checks on cold-start CVS test on 25 percent of cars.

General Motors currently has 21 plants assembling passenger cars and light trucks. Three of these assemble light trucks only, and thirteen build or have built both California models and Federal models. The California-plus strategy would require converting additional plants to two-car output and/or cross-shipping cars at additional expense to the public.

4.2.1.3 Ability to Market New Cars

A two-car strategy should provide no marketing problem for General Motors, even for extending the California-plus strategy to all AQCRs with a serious automotive problem. Their current network of assembly plants and zone offices should be adequate, although it could be very difficult, though not impossible, to provide a full model mix for all included cities.

General Motors feels that the major marketing consideration is the pricing problem. Their past California experience suggests that the additional hardware and costs of the low-emission car could best be handled as a "mandatory option."

4.2.1.4 Ability to Service Two Vehicle Classes

General Motors foresees no real problems with either parts or labor under a two-car strategy. Of course, they might have to use air-shipping of special parts for inoperative vehicles outside their own region. If both car types were substantially similar, except for the catalytic converter, servicing difficulties would tend to diminish.

Service complexity is increased for the California-plus strategy because of distribution requirements. Parts would need to be available almost on a nationwide basis. Special service equipment would be required in all dealerships, and a nationwide training program for servicemen would be needed.

4.2.1.5 Vehicle Identification - By Control System Type

General Motors' vehicle identification number (VIN) uses 13 digits. They feel that there may be a way to add a digit or redesignate the VIN to show the car emission control system type. One method might be to group the manufacturing sequence numbers of the two car classes. General Motors cautions that adding a digit to the VIN may be a problem, since some states can only pick up 13 characters on their reading equipment.

In any event, General Motors feels that a "use sticker" of some sort will be required in addition to registration control.

4.2.1.6 Dealer Delivery Control

In the case of General Motors, their California dealers can only obtain "California cars." The California emissions package is merely considered similar to other options. First, the dealer checks the order if a California emission package is desired (buyers name and address are not on the order). Then, a computer scans the order and all California dealers get cars with the California package whether they ordered it or not. (Non-California cars get the California package if they desire.) The current principal difference between California and non-California cars is the $15 price tag for assembly-line testing.

General Motors cautioned that dealer delivery control is somewhat ineffective due to dealer-to-dealer trades and fleet sales. Dealer trades are both significant and common. Fifty percent of the new cars in the Detroit area were involved in dealer trades within the area. General Motors had 500,000 fleet sales in 1972. These cars are ordered in one state, but delivered in another.

4.2.1.7 Nationwide Marketing/Design Impact

General Motors feels that a two-car strategy would not have a great nationwide marketing/design impact, one way or the other. They feel that the California-only, one-year strategy would not do too much for product improvement. Only about 7 percent of General Motors sales are in California, and the one-year period would not provide an adequate sample of high-mileage cars, thus not yielding much field experience. Nor would it provide adequate time to incorporate changes in the next year's models.

However, the California-only strategy would enable discovery of "infant mortality" failures (those failures which occur early in a model year production run) and would give an additional year for further testing prior to the nationwide use of a catalyst. It would also greatly lessen the assembly-line impact of the catalytic converter. Traditionally, a new system (e.g., a new transmission) is introduced in a low volume car line before all-model production is undertaken. It often takes five years to introduce the new system into all car lines.

4.2.1.8 Unleaded Gasoline Requirements

General Motors would encourage the use of unleaded gasoline for noncatalyst systems (e.g., the car meeting 1974 standards), but they would not make it mandatory for such systems to use unleaded gasoline (e.g., by using gas-tank filler arrangements for unleaded gasoline on noncatalyst cars).

4.2.1.9 Requirement for Retrofit of Lesser-Controlled Cars

General Motors feels that a complete factory-installed type of emission control system cannot be retrofitted. Components may be retrofitted, but not such items as cylinder heads, etc. The closer the two classes of cars resembled one another (in terms of hardware components) the easier retrofit would be. General Motors referred to the air-conditioner analogy, where it has not been found practical to retrofit with factory-type systems. Add-on air-conditioner systems have been the only practical way of retrofit, and no such add-on units are being or have been developed for 1975-type emission control systems.

4.2.2 Ford

4.2.2.1 General Attitude Toward/About Two-Car Strategies

Ford advocates a California-only, two-car control strategy (see Appendix E) wherein the California cars would incorporate a catalyst while the rest of the nation would use cars with emission levels similar to the 1974 models. They might prefer a two-year plan instead of a one-year plan in order to be able to incorporate any meaningful design changes (product improvements) and to provide better training and servicing.

Ford's principal arguments for the California-only strategy include:

a. They need a limited approach to permit learning about the technical unknowns of catalyst systems (although they still may get insufficient mileage accumulation per car in a one-year plan).

b. It is the logical "next step" to their current California developmental test fleet program (where 500 Fords will be built on the Los Angeles assembly line starting 1 April 1973 and tested in fleets in the Los Angeles, Sacrmento, and San Francisco areas).

c. It would guard against "cataclysmic" effects of failures which could happen if introduced nationwide.

d. It is the closest thing to the normal industry approach for new and improved design introduction where a single car line is used (here it is a single state instead of a single car line).

e. They have been working with a two-car, California-only strategy since 1966 and definitely feel it can be done.

Ford feels that any viable two-car strategy must have the degree of regulation that California currently exercises or the program may be a failure, at least as far as the car owner is concerned, since the anticipated benefits will not be realized. They also feel that legal problems may be "horrendous" unless an affected state has regulations encompassing:

a. State-controlled mandatory vehicle inspection with emissions testing and certified mechanics and inspectors

b. Vehicle registration control based on residency requirements

c. Vehicle alteration rules prohibiting tampering with the emission control system.

Ford feels that the expansion of the two-car approach to include a multiplicity of cities and/or regions is incalculably complex and difficult to administer. It would be disruptive of normal channels of distribution, sales, and enforcement for the consumer, the auto manufacturer, and the government.

4.2.2.2 Ability to Produce Two Classes of New Cars

As far as Ford is concerned, the number of states involved has a big impact on the feasibility of producing two car classes. For example, they have 18 U.S. passenger car assembly plants for Ford models. Nine of these plants build cars for California sales, and their California assembly plants ship cars out of California.[5] Some plants produce only one line of passenger cars. In many cases, their sourcing patterns change from time to time, even within a single model year, since the plants have the capacity for production changes.

The number of constant volume sampling (CVS) test facilities and associated time and dollars increases as the number of states increase. The emission test type(s) required under a two-car strategy is very important; Ford would need to know if other test facilities are required. If 5 percent of the cars produced were tested on the CVS cycle, this would cost hundreds of millions of dollars in facilities (e.g., extensions of plant buildings and expensive testing equipment).

Adding a multiplicity of additional areas (e.g., California-plus strategy) would involve more Ford plants and considerably more complexity, the extent varying with each plant and each car line mix.

4.2.2.3 Ability to Market New Cars

Ford has 34 sales districts in the U.S., and Lincoln-Mercury has 19. Two of the Ford and two of the Mercury districts are in California (and cover Hawaii as well); therefore, the California-only strategy is not too bad logistically (about 10 percent of Ford's national sales are in California).

Their sales districts are not coincidental with geographical or governmental boundaries, as their marketing areas are drawn to encompass cross-sales which are affected by the density of locations and people. In general their sales districts are smaller than standard metropolitan statistical areas (SMSAs). They don't know what the break-even point would be in terms of adding other states or regions to California as part of a control scheme. However, adding other areas would reduce the marketing flexibility of both types of autos (e.g., one Phoenix dealer presently gets cars from six different assembly plants).

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[5] California assembly plants produce 40 percent Fords and Thunderbirds, 10 to 15 percent Pintos, and 50 percent trucks.

Ford has not determined what their car pricing policy would be under a two-car strategy (i.e., charging California owners total cost vs spreading cost out over all cars). However, warranties would be the same as now (i.e., replace defective parts).

4.2.2.4 Ability to Service Two Vehicle Classes

Ford feels they can properly service cars under the California-only strategy. Their central warehouses in Los Angeles andSan Jose also respond to parts requirements in other parts of the state.

Servicing and training (manuals, etc.) would be easier on a statewide basis since training programs could be initiated in a limited area. Faster customer response could be provided by limiting the low-emission car to one concentrated area (California) to begin with. Service difficulties could be more easily resolved and parts provisions could be expedited

4.2.2.5 Vehicle Identification -- By Control System Types

Ford agreed that it might be possible to add a number or letter to their current 11-digit vehicle identification number (VIN) system to identify emission control system type. However, they object strongly to doing so. They point out that all Ford historical data banks are keyed to their 11-digit VIN system. The VIN is used in hundreds of places and all records would have to be changed. They estimated it wouldcost several million dollars to rebuild their computers and refit the stamping and body machines that physically record VIN numbers on vehicle and engine parts.

As previously reported, Ford suggested instead that they could produce an "after-the-fact" machine-processible record (tape) of cars produced to meet standards of a given control region. Although not part of the VIN, such a record could be used to verify emission control system type.

4.2.2.6 Dealer Delivery Control

Ford builds and delivers new cars to dealers solely on the basis of physical order forms sent by the dealer to Ford. The order form is checked visually at the sales district level to see if the dealer has ordered the proper emission package, but this is the only control exercised by Ford. The dealer is responsible for determining that he has ordered the proper car for the customer.

Even if Ford had contract authority to exercise more stringent control over dealer orders, they feel that the lack of uniformity in state laws concerning producer/dealer contracts would preclude them from effectively exercising such control. They feel they may not be able to keep a dealer from buying cars to sell in other areas.

Ford points to the problems of split sales districts, fleet car buyers, and border dealers as further complications in dealer delivery control. Ten percent of Fords' factory orders are from dealers who stipulate delivery to other dealers; this is in addition to interdistrict transfer between dealers.

Border dealers, whose location enables them to sell in more than one state, are a unique problem. Ford currently allows the border dealer in California to decide whether the California emissions package is required on cars ordered.

4.2.2.7 Nationwide Marketing Impact

Ford feels that their ability to market cars nationwide under a two-car strategy depends on:

a. The type of responsibility imposed on the auto company

b. The selection of control regions on the basis of governmental and geographic considerations, wherein state regulations would be in support of a two-car strategy.

When the control areas are extended beyond California, Ford feels there is a ten-to-twenty fold increase in complexity; therefore, they do not think the California-plus strategy is very practical.

4.2.2.8 Requirement for Retrofit of Lesser-Controlled Cars

Ford feels that although it may be "feasible" to retrofit 1975 catalyst systems, it is impractical from a cost standpoint.

1966/67 Ford cars were not retrofittable to the California configuration (i.e., air pump and air injection in the exhaust manifold). California currently recognizes retrofit impracticality of factory-installed systems since:

a. If a car has been registered outside California, it is acceptable in California if it has crankcase controls

b. If a used car has been properly registered elsewhere, it can be sold in California.

4.2.2.9 Unleaded Gasoline Requirements

Ford had no position on the issue of requiring the use of unleaded gasoline on noncatalyst cars meeting 1974-level standards.

4.2.3 American Motors

4.2.3.1 General Attitude Toward/About Two-Car Strategies

American Motors advocates a California-only, two-car strategy in which California cars would incorporate a catalyst and the rest of the cars would not. They do not feel that a one-year period is sufficient, but it is better than nothing. They feel the strategy should apply across the entire model year (don't want any 1975-1/2 models, for example).

From American Motors' viewpoint, the principal arguments for their approach include:

a. It would provide more learning time. Carburetors need more development time; new intake manifold designs may have maldistribution problems affecting HC control.

b. It would provide a measure of cost effectiveness, since knowledge gained on initial catalyst designs would allow revisions for lower-cost production. "Guessing" could be eliminated in some areas: double-wall exhaust pipes might not be required, and altitude compensation may be needed only for the main carburetor system and not for all modes.

c. It would provide a statistical base for projected warranty recall costs in terms of warranty dollars expended by dealers. This is the most important feature of the California-only, two-car strategy to American Motors.

4.2.3.2 Ability to Produce Two Classes of New Cars

American Motors has a single major manufacturing plant for car components (engines, etc.) located at Kenosha, Wisconsin. They have four assembly plants; however, the Kenosha facility is the major assembly plant. It supplies every car model to every sales zone and supplies all of the California car models. Another assembly plant in Brampton, Ontario, Canada supplies some car models to some sales zones. New York, for example, gets some car models from Brampton and some from Kenosha. The jeep assembly plant is located in Toledo, Ohio and also does some manufacturing, although all engines come from the Kenosha manufacturing plant. Another facility (AM-General Corporation in South Bend, Indiana) exclusively produces government vehicles.

Under a two-car strategy, both vehicle classes would be produced with one common body line, the V-8 intake manifold would also be common. Catalysts for the low-emission car would be purchased. American Motors is currently committed to catalyst tooling costs, but have to purchase only the actual number of catalysts required. For smaller lots of currently unreleased items for "low-emission" cars, they could go to off-line production if the number of vehicles involved were not too large.

4.2.3.3 Ability to Market New Cars

American Motors has 20 zone sales offices in the U.S. Two are located in California (Los Angeles and San Francisco) whose sales represent about 7 percent of American Motors' total market. Another sales office is located in Portland, Oregon. American Motors feels they can control their marketing under a two-car strategy if the control region is large enough in size.

They have not determined what their car pricing policy would be between the low-emission car and the higher-emission car.

4.2.3.4 Vehicle Identification -- By Control System Type

There is currently no distinction in vehicle identification number between California cars and other models. Underhood labels and labels on rear corner windows are used to specify emission control system type and capability.

4.2.3.5 Dealer Delivery Control

American Motors feels that any attempt to control deliveries to dealers would be much simpler on a statewide basis, as opposed to a county or other regional basis.

4.2.3.6 Ability to Service Two Vehicle Classes

American Motors has more parts warehouses than sales zone offices. They have a parts "hot line" system which guarantees parts delivery to warehouses within 24 hours. Therefore, under the California-only strategy a California driver with a breakdown out-of-state might have to contend with this 24-hour delay problem.

In the area of service training, American Motors feels they would have some problems but not insurmountable ones. They would plan to update mechanics by providing service instructions for all car models and control regions and by using training vans within the low-emission controlled region.

American Motors' California car models have had unique components for many years (evaporative systems, carburetors, air injection, etc.). They have utilized formal monitoring surveys where all dealer service reports are prescanned at the zone office and segregated and fed through the American Motors central computer as a California batch. They also have selected dealers who send in "hot line" service reports which are scanned by eye and do not involve a computer delay.

Field surveillance would be a problem for American Motors, since they do not have a California-based operations staff. They would have to hire someone to do the job for them, and this may be expensive.

4.2.3.7 Nationwide Marketing Impact

American Motors feels that implementation of a California-only two-car strategy would enhance their ability to eventually market nationwide on a more realistic basis. They need to develop statistics concerning:

- What happens in assembly-line runs
- Variations in emission level spread
- Assembly-line testing variations
- Malfunction modes
- Lean-to-rich carburetor calibration effects
- Wet spark plug effects
- Vibration modes (misalignments, etc.)
- Fuel economy effects.

4.2.3.8 Requirement for Retrofit of Lesser-Controlled Cars

American Motors feels that such a requirement is a severe one. It may be physically possible, but the basic issue of economics may preclude it. For example, it may be possible to add a catalyst, but it would be much more difficult to make other system changes which may be part of the overall control system (intake manifolds, air injection, controls, etc.).

It is conceivable that one could plan for retrofit by making the cars identical except for the catalyst. However, the question would remain as to whether or not this would be equitable to the buyer of the lesser-controlled car.

4.2.3.9 Unleaded Gasoline Requirements

American Motors feels that noncatalyst systems should still require the use of unleaded gasoline. They point to the benefits of:

a. Lower NO levels (affected by deposits in the EGR system).
b. Lower HC levels (affected by valve deposits, valve seating, etc.).

However, a decision to equip noncatalyst 1975 cars with gasoline-tank filler tubes to "force" the use of unleaded gasoline has not been made.

4.2.4 International Harvester

4.2.4.1 General Attitude Toward/About Two-Car Strategies

International Harvester feels they could handle a California-only strategy; they have done so in the past. If a California-plus strategy were adopted, they feel the added regions would have to be large geographical areas; the strategy gets less feasible as the areas get smaller.

4.2.4.2 Ability to Produce Two Classe of New Cars

International Harvester feels that they can produce under a two-car strategy as long as no more than two classes are involved. Special orders have predominated for them (more than the rest of the industry) because of their production of light trucks and multipurpose vehicles. They make all their light-duty vehicles at Ft. Wayne, Indiana and Springfield, Ohio.

4.2.4.3 Ability to Market New Cars

New cars are shipped to six inventory places after manufacture by International Harvester. They feel that they could have marketing problems under a two-car strategy unless the control regions are large and include metropolitan areas to ease inventory control problems and to facilitate disposal of used vehicles. They also feel that retail dealers cannot be held responsible for the end use of cars delivered to them.

4.2.4.4 Ability to Service Two Vehicle Classes

This should be no problem to International Harvester; it would be similar to the different control systems serviced in the past.

4.2.4.5 Dealer Delivery Control

International Harvester's control over dealers is by contract only, and this control authority differs from state to state.

They do have some checks on dealer orders to make sure that proper emission control packages are ordered, including:

a. Screening of orders at zone level
b. Screening of orders at regional level
c. Screening of orders by computer.

4.2.4.6 Requirement for Retrofit of Lesser-Controlled Cars

International Harvester feels that it would not be practical to retrofit emission control systems per factory installations and guarantee to meet emission requirements. Control systems, as well as catalysts, would have to be included in the retrofit.

4.3 SUMMARY OF AUTO INDUSTRY CONSIDERATIONS

4.3.1 General Attitude Toward/About Two-Car Strategies

With the exception of Chrysler,[6] the domestic auto manufacturers were generally in favor of a California-only, two-car strategy. This strategy would only require use of catalysts in from 5 to 10 percent of each individual manufacturer's new cars. These same companies were generally opposed to any California-plus strategy primarily on the basis of assembly, distribution, and marketing difficulties. If a California-plus strategy were implemented, however, the prevailing opinion was that any added geographical areas should be as large as possible.

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[6] Chrysler opposes any strategy requiring the use of catalysts.

On the other hand, the foreign auto makers are generally opposed to any mandatory two-car strategies; they prefer optional phasing-in processes for catalysts. With regard to a California-only strategy, they feel that the percentage of their U.S. car sales in California is much too large to represent test case purposes (e.g., Nissan, about 32 percent, Toyota, about 22 percent, VW, about 17 percent). Their distribution and marketing problems would further escalate under a California-plus strategy; Nissan states (as previously reported) that such problems would be "too big to imagine." It should be noted that the car sales in California of these manufacturers are a relatively small portion of their overall passenger car output (e.g., Nissan ~5.01%, Toyota ~4.67%, Volkswagen ~5.38%).

4.3.2 Ability to Produce Two Classes of New Cars

There is generally no question but that two classes of cars can be produced; however, there is an associated degree of difficulty which varies with the size of the auto company. It is more of a problem as the company gets smaller (Nissan feels it might not have adequate lead time to get two types of cars on the assembly line). The California-only strategy, aside from any catalyst-system-unique production problems, is not unusual, since the auto companies have worked with California-unique emission control systems since 1966. The California-plus strategy would involve more assembly plants to handle catalyst-equipped cars and entail additional complexity. Additional assembly plants would have to be converted to two car lines; cross-shipping of cars may also be required (at additional consumer expense).

4.3.3 Ability to Market New Cars

Again, as with the case of car production, there is generally no question but that two classes of new cars can be marketed. There is, however, a major impact resulting from the number of control regions involved in a two-car strategy. The California-only strategy has been in effect since 1966 with marketing groups set up to handle the California region effectively.

The California-plus strategy may be highly disruptive of distribution and sales channels, unless the additional areas are sufficiently large in size. It is not an impossible task but it may be very difficult to provide a full mix of new models to all cities involved in such a strategy. The degree of difficulty, of course, would increase with the increasing number of added control areas.

The car pricing policy has not as yet been determined (e.g., low-emission car owners charged total cost vs spreading cost out over all cars). It has been suggested by General Motors that it could best be handled as a "mandatory option" as done in California in the past.

According to Ford, the warranty interpretation under a two-car strategy would remain as it is now (replace defective parts).

4.3.4 California-only Strategy Comments Summary

Claimed benefits include:

a. It provides more learning about technical unknowns.

b. It is the logical next step to current developmental test fleets.

c. It is the closest thing to the normal industry approach for introducing new and unproven designs.

d. If problems develop only a limited percent of the total car production would be affected (6 to 10 percent for domestic manufacturers; up to 32 percent for foreign manufacturers).

e. It lessens assembly-line impact.

f. Service parts distribution and training can be more thoroughly evaluated in a limited area.

g. In the event of a recall or modification, all vehicles would be in one geographical area.

h. It has certain potential economic benefits (e.g., it would guard against the cataclysmic effects of failures across the total production line); the knowledge gained on initial catalyst designs would allow revisions for lower-cost production; it would provide a statistical base for projected warranty-recall costs at limited risk (6 to 10 percent of sales in California for major U.S. auto makers).

i. It would be a continuation of a California-only, two-car strategy that was begun in 1966 and which has been shown to be workable.

Claimed disadvantages include:

a. The one-year time period may not permit enough mileage accumulation.

b. The one-year period may not permit enough time to incorporate design modifications.

c. The California sales of some importers are much larger than of some domestic automakers, thus posing a more severe burden on them (e.g., 32 percent of Nissan's sales, 22 percent of Toyota's sales, and 17 percent of Volkswagen's sales are in California). However, their California car sales are a much smaller percentage of their overall passenger car output (e.g., Nissan ~5.01%, Toyota ~4.67%, Volkswagen ~5.38%).

4.3.5 California-plus Strategy Comments Summary

No benefits were stated or claimed from the auto company viewpoint for a California-plus strategy. Previous General Motors support for a California-plus strategy was based on different 1975 emission standards which, in all likelihood, would not have involved the use of catalysts.

Claimed disadvantages include:

a. It increases manufacturing and distribution problems.

b. It involves a complex and difficult enforcement system.

c. It is very disruptive of normal channels of distribution, sales, and enforcement.

d. Any areas added to California would have to be large geographical areas; the strategy gets less and less feasible as control regions get smaller.

e. Nissan claims the problems of a California-plus strategy are "too big to imagine" from their point of view.

SECTION 5

STATE OR REGIONAL CONSIDERATIONS

5.1 SUMMARY OF STATE OR REGIONAL ISSUES

The following sections summarize the state or regional viewpoints on issues concerning the two-car strategy options as they impact the various jurisdictions that are candidates for control.

Because of the length of this section and the level of detail treated, an overview of state or regional considerations is presented in Appendix G in briefing chart format.

5.1.1 Reactions to Two-Car Strategy

The California-only strategy impacts the air quality implementation plans of other states. The impact varies in degree, depending upon the contribution of vehicle sources to the degradation of air quality in the candidate control regions. For example, the effect is more significant in the New York Metropolitan area than in the Minneapolis/St Paul region, where the effect is relatively mild.

Complications associated with the implementation and administration of a regional control strategy for a one-year duration is such that many states would prefer the option of accepting 1974 automobile exhaust emission levels for 1975 model year cars, provided the schedule for meeting national air quality goals were extended. For nearly all of the candidate control regions, an additional year of new car emissions at the 1974 level would have a relatively small effect on air quality and, therefore, would be acceptable.

Most states regard regional control within the state to be an unmanageable proposition in at least two respects. One of these concerns public reaction inside and outside of the region selected for control; the other concerns the lack of appropriate legislation and authority for implementing, administering, and enforcing a local control program. Many states, such as New York, Texas, Massachusetts, and Utah, felt that control of a metropolitan region would not be acceptable unless all similarly affected metropolitan areas within the state were also designated as control zones. Another common objection to the regional approach was the difficulty of maintaining the integrity of zone control in the face of a significant price difference between the two classes of new cars. Arguments against a broad-based control region were raised in those areas where auto pollution problems are concentrated in small central business districts. Most frequently, however, uniform control throughout the state was preferred to the regional control approach.

The majority of states or regions favored the California-only strategy. An exception to this position was New York City where, in the Manhattan area, new cars and taxis represent an exceptionally large fraction of the total vehicle population. Washington, D.C. argued for 1975 exhaust emission standards but conceded that the administrative complications involved in setting up a regional control program outweighed its value for a one-year application.

California would accept a statewide California-only strategy for a one-year period provided that EPA mandates a supply of nonleaded gasoline throughout the nation. However, the state has serious reservations about being saddled with an emission control system which may ultimately prove to be unsuitable. A regional control strategy within the state was rejected as being unworkable.

5.1.2 Background/Experience Related to Vehicle Control

Some degree of experience and background in vehicle control and surveillance may be found in every state. However, California is uniquely equipped in terms of experience and regulatory procedures for the administration of a regional emissions control program. For example, California presently has both a regionally based and a statewide-based retrofit program. Compliance with state emission laws is a requirement for vehicle registration. A system of state-licensed garages capable of certifying emission equipment on a functional basis has been established. An on-highway emission inspection program is in the pilot stage of development. The state has established a current program and procedures for assembly line inspection. Legislation for enforcement and penalties for violation of emission laws has been enacted. However, with all of these experience factors and existing capabilities, much new legislation would be required to implement the proposed two-car strategy.

Washington, D. C. has a mandatory annual inspection program for D. C. government vehicles that is tied to the existing safety inspection program required for all D. C. passenger cars. New Jersey's emission inspection program, also tied to safety inspection, becomes fully effective commencing July 1, 1973. Regional emission inspection programs that are tied to areas with severe automobile pollution problems are proposed in the implementation plans of a number of states such as Oregon, Washington, and Arizona. These programs, when linked with vehicle registration, represent the means by which two-car strategy control may be implemented.

A number of states have a mandatory periodic safety inspection program. Few of these are tied to vehicle registration. However, New York and New Jersey are two exceptions.

No existing regulations require proof of residency for registration. A number of states do not identify the domicile of the vehicle by county or other jurisdiction. Accordingly, development of new laws and procedures would be needed in each of the areas proposed for control.

Nowhere are retrofit programs in force except in the State of California. Regional retrofit programs have been proposed in some areas including New York City and Washington, D. C. However, the possibility of implementing these proposed retrofit programs by 1975 seems extremely remote.

5. 1. 3 Region-Peculiar Factors

California's size, population distribution, and border situation lends itself to two-car strategy control.

The proximity of population centers in a number of east coast regions requires interstate control zones in order to simplify the problem of control and in order to realize a beneficial effect on air quality.

Many of the AQCRs considered for control are largely rural with only localized mobile source pollution problems.

Unique situations exist in Alaska and Colorado. With regard to Alaska, catalyst control systems may not be effective in view of the Alaska cold weather and CO and the ice-fog problems. Colorado and other high-altitude areas require waivers to adjust emission control settings for high-altitude effectivity and vehicle driveability.

5.2 DISCUSSION BY STATE

California is discussed first, followed by other potential low-emission control areas in alphabetical order.

5.2.1 California

State and regional considerations pertaining to the two-car strategy in California are summarized below. The information given is based upon discussions held in Sacramento, California with personnel from the California Air Resources Board, the California Highway Patrol, and the Department of Motor Vehicles, augmented by data from the official publications of these and other state agencies.

5.2.1.1 Reactions to the Two-Car Strategy

In general, the reaction to the strategy option calling for California-only statewide control suggests that the plan was regarded to be feasible, though frought with many possible serious administrative and technical difficulties. Factors mentioned as supporting the feasibility of the plan with respect to its application in the State of California were as follows.

First, the precedent for a special California emission control package and the basis for its public acceptance has already been established by the state's exhaust emission control program, which has imposed requirements that are generally more severe than those applicable to the rest of the nation. Moreover, this program has evolved a special body of laws and administrative procedures which, in some part, may be applicable to the proposed control strategy. In particular, penalties for noncompliance and procedures for testing and certifying new car control equipment may be directly transferable to the proposed program.

Another factor supporting the feasibility of the California program is the geography of the state's borders and the remote location of its urban population centers with respect to these borders. This situation represents a close approximation of an isolated market for the sale of stringently controlled new cars. It minimizes the problem of controlling out-of-state car purchases by residents of the control region as well as the degradation of air quality due to in-state circulation of cars from uncontrolled regions.

Problems anticipated in implementing a California program include the requirement for changing existing laws pertaining to the state's present autonomous position in regulating and administering new car control programs. These changes would impact (for example) the authority of the Air Resources Board to review and approve standards, control devices, assembly line inspection procedures, and the authority of the Department of Motor Vehicles to enforce state regulations concerning vehicle registration and operation. Options available to the state under a federally mandated new car emission control program would be (a) to change the existing laws, (b) to stretch the interpretation of existing laws where possible, (c) to adopt Federal standards as California state standards, or (d) to continue to operate on a waiver basis by adopting standards that are slightly more severe than the Federal standards.

Another significant problem anticipated was availability of the nonleaded gasoline needed for catalyst-equipped California cars operating outside of state boundaries. Serious questions were raised as to the feasibility of enforcing a federally mandated requirement for nationwide distribution of nonleaded gasoline solely on the basis of its possible need by new California cars (representing only about one percent of the total car population).

The incentive for and consequences of California residents buying new cars out of state and registering them as used cars in the state was considered. The California vehicle code defines a new vehicle as one that has never been sold and operated on the highways of any other state. If the price differential between the two classes of new cars were significant, the incentive would exist for purchasing and registering new cars out of state or for registering a new car purchased out of state as a used vehicle in California after it had been registered or driven in an out-of-state zone. With regard to the seriousness of this problem, it was considered that (a) marketing objectives might minimize the price differential between cars, (b) the existing code definition of a new vehicle could be appropriately altered if justified by public reaction, and (c) the number of violations likely to be involved would have negligible effect on air quality for a one-year program duration.

Reactions to a regional control program within the state were largely negative. It was suggested that a likely region for control would be a combination of the South Coast and San Diego air basins. Proof of residency as a condition for new vehicle registration might be required in order to ensure compliance with the law by residents in the control region. This would entail a change in the existing registration code, which does not demand verification of the domicile of the vehicle. The most serious objection raised to this proposal, however, related to the anticipated difficulty of convincing state legislators that either control or no control was suitable for their respective jurisdictions.

The principal concern expressed in response to the California-only strategy was that the state would be cast in the role of a "guinea pig" for the trial development of an emission control system that may ultimately prove to be unsuitable. On similar grounds, the state would object to a program of indefinite duration, which might lead to the evolution of a unique but burdensome solution to the California control problem.

In summary, a one-year statewide program was regarded to be an acceptable possibility, provided (a) that the EPA could mandate a supply of nonleaded gasoline throughout the U.S. for the control year under consideration, and (b) that catalyst systems would not be dropped the following year.

5.2.1.2 Background/Experience Related to Vehicle Control

5.2.1.2.1 Vehicle Registration Control

Similar to other states, California requires registration of passenger cars and other operating vehicles on a yearly basis. The process has been centrally controlled by the Department of Motor Vehicles (DMV) in Scaramento. Applications for reregistration are mailed to the address provided in the previous registration application. The DMV must be notified of a change in address within 30 days, and the new address must be provided in the application for reregistration.

It is noted that the address provided for vehicle registration purposes may be a business address, a residence address, or simply a mailing address; it need not be the domicile of the vehicle being registered.

California vehicle registration is recorded on a county basis, primarily for the purpose of disbursing license fee and gas tax revenues to the various counties for road construction, highway patrol operations, and other county programs. On registration, the applicant is required to certify that he has resided in a specific county during the previous year. However, this requirement refers to the domicile of the registrant, not of the automobile registered. No proof of residency is required; no surveillance of the accuracy of the residency statement is conducted.

With regard to registration procedures for new car sales, the dealer is required to certify that the vehicle sold to a California resident is equipped with the appropriate emission control package for the state of California. Since proof of residency is not a registration requirement, it appears possible to circumvent state laws by ordering a nonequipped car from a California dealer on the basis of the purchaser's claim that he resides outside of state boundaries. As noted earlier, another circumvention technique would be to purchase a nonequipped car outside of the state and register the vehicle in California as a used car, which existing state laws exempt from California new car controls.

Out-of-state vehicles domiciled in California are permitted to operate on California roads for a period of up to one year without reregistration as long as their current-state registrations are valid. There is no overt program for enforcing this requirement, even though differences in registration fees sometimes provide the incentive for reregistering resident cars out of state. This is possible because the lack of conditional registration requirements (safety, emissions inspection) in many states makes it simple to reregister in absentia.

5.2.1.2.2 Safety Inspection Program

California does not have an established, periodic safety inspection requirement program. Safety inspections on a random sampling basis are conducted in an on-highway program referred to as the California Passenger Vehicle Inspection (PVI) program. This program utilizes mobile inspection teams positioned randomly throughout the state. There are 71 teams consisting of 5 men each. On-highway inspection locations are changed regularly so as to achieve uniform sampling and surveillance throughout the local inspection zones.

Items of safety covered in the inspection include lights, brakes, tires, windshield wipers, horn, and turn signals. An examination of the engine compartment is also made for the purpose of surveying the complement of emission control equipment. In this check, items such as the PCV valve hose, air injection pump, carburetor linkages, and other obvious emission hardware are examined. In addition to this gross check, eight of the inspection teams have been equipped with exhaust-gas analyzers for measuring HC and CO emissions. This adjunctive program is designed to reject and eliminate high emitters.

The inspection process takes 3 to 5 minutes. Each team processes about 150 cars per day. About 12 to 15 percent of the car population is checked yearly by this process.

Upon failure of any part of the safety or emission check, a citation is issued. Corrective repair or adjustment is required to be made and verified by the Highway Patrol within 14 days. If the failure involves headlights or emission control equipment, the corrective action must be carried out and certified by a state-approved "Class A" garage or service station. An approved vehicle is issued a color-coded windshield sticker indicating that the car has been sampled in the current year.

5.2.1.2.3 Emission Inspection Program

Scheduled emissions inspection is not a requirement for California cars. The emissions inspection tied to the random, on-highway safety inspection program is estimated to impact from 1 to 2 percent of the car population yearly. As indicated earlier, this program is designed to eliminate on-highway excessive polluters. Pass/fail emission levels are presently set so as to reject 23 to 25 percent of the cars inspected. Corrective action by state-approved garages is required to be completed within 14 days.

All California new cars are assembly-line tested for emissions. Seventy-five percent of production is subjected to an idle mode test, and 25 percent is subjected to one hot 7-mode cycle test. In addition to these tests, a quality audit sample consisting of 2 percent of production is subjected to the Federal CVS cold-start test.

Primarily, the assembly line testing program is designed as a screening device to eliminate vehicles on the high end of the production-tolerance emissions distribution curve. The standard of performance is defined by a 100-car sample taken at the beginning of each production quarter. This sample is subjected to the idle and 7-mode tests, and the distribution of emissions obtained by each test is established. From these distributions, the emission levels at two standard deviations above the mean are used to delineate the pass/fail points for the respective test cycles in the current quarter. The quality audit sample provides the mechanism for controlling production quality with respect to official California emission standards and test procedures.

There is another California emissions inspection mechanism which is tied to the registration of cars previously registered in other states. A precondition for such registration is a "Certificate of Compliance" obtained from a state-approved Class A station, which verifies that the vehicle is equipped with emission control equipment suitable for meeting state or Federal standards, depending upon the vehicle model year. Model year cars of 1971 and later are required to meet Federal levels for equipment. Older cars are subject to a retrofit requirement in accordance with the state's recently instituted retrofit programs. At present, the compliance inspection consists of a visual and functional check of equipment and does not include an emissions measurement.

5.2.1.2.4 Retrofit Program

There are two California retrofit programs in force: one applies to 1955 through 1965 cars; the other applies to 1966 through 1970 cars.

The 1955/65 retrofit program is a regionally based plan covering essentially the South Coast Air Basin, San Diego County, and the San Francisco Bay Area. Two retrofit devices (essentially spark-retard mechanisms) have been certified for use. Retrofit becomes mandatory either upon transfer of vehicle ownership or upon registering a vehicle in this model year group in the state for the first time.

Enforcement of the 1955/65 program is accomplished by requiring a certificate of compliance as a condition for either first registration or reregistration and transfer of title. The certificate is issued by a state-approved Class A station and verifies that the vehicle is appropriately equipped for the address of residency provided by the owner. It is noted that the compliance certificate does not display this address. The Department of Motor Vehicles is not empowered or equipped to verify that the address provided for registration coincides with the information given for the certificate of compliance. Used cars sold by dealers are equipped on the basis of the dealership address. In the case of private cars, it appears that no completely satisfactory mechanism for enforcing this law exists. This program has been in force about one year and its effectivity has not yet been evaluated.

The 1966/70 model year retrofit program is a statewide program designed to improve NOx emissions in model year cars originally controlled only for HC and CO. Four devices have been certified for use by the Air Resources Board. These are all spark-retard mechanisms combined variously in individual cases with EGR and thermal protection mechanisms. This program, which began in February 1973, is being introduced on a countywide basis. Beginning in 1975 the final mechanism for statewide enforcement will be proof of installation verified by a certificate of compliance as a condition of any reregistration.

5.2.1.3 Region-Peculiar Factors

California's large automobile population of approximately 9 million cars represent about 10 percent of the national total. The new-car fraction, which is also close to the national average of 10 percent, provides a sufficiently large sample for a representative performance evaluation of the 1975-type emission control system. Variations in geographical and climatic factors over the state provide for a broad range of driving conditions that encompasses many of the situations met nationwide.

The number of nonresident vehicles registering annually is a small fraction (about 2.5 percent) of the total vehicle population. From the standpoint of air quality considerations, therefore, the impact of uncontrolled new cars taking up residency in the state would not be great.

California is unique in that the state is presently operating on the basis of a two-car emission control strategy. This has evolved as a result of the special requirements needed to meet California's exhaust emission standards, which, as previously discussed, are more stringent than standards applied elsewhere in the nation. As a result of this situation, and by virtue of its unique experience, California is better equipped to administer a two-car strategy.

The geography of the California border and the relative locations of large population centers comprise a nearly ideal situation with regard to controlling purchases of noncomplying new cars. This feature appears especially attractive in the light of other alternatives to control. For example, the possibilities for adopting a retrofit program as a means of deterring the purchase of uncontrolled cars from out of state seem poor when California's experience in implementing retrofit programs is considered. A total of three years were required to launch the 1955/65 retrofit system, considering the time required to enact the enabling legislation, define the performance specifications for the device, test and certify systems, and make the hardware available for distribution. It is estimated that any new retrofit program would require a minimum of 15 months to implement, assuming that the enabling legislation were already available.

5.2.2 Alaska

Two-car-strategy considerations for the State of Alaska are summarized below. The bulk of this information was obtained by telecons with personnel in the Alaska Department of Environment Conservation.

5.2.2.1 Reactions to Two-Car Strategy

The 1975 emission standards will have little effect on the Fairbanks air quality. A 70-percent CO reduction is required to meet the Federal air quality standards. This could only be achieved in 1975 by a severe reduction in vehicle miles traveled (VMT).

The city of Fairbanks lies in a natural bowl, and the region is characterized by extremes of low temperatures and inversion conditions. A long, stable ice fog occurs in winter when the temperature is -30°F or lower, which is caused by the water vapor in the automotive exhaust. The net effect of fog is to reduce vehicle speed, thereby increasing the rate of CO emissions. High CO emissions are also caused by the cold-weather effect on engine starting and operating conditions: drivers start their cars before they intend to use them and keep them running the entire day, thus causing considerable idle CO emissions. The fog problem will not be helped by the use of catalyst systems.

Fairbanks is not a wealthy community. An adverse reaction is to be expected if Fairbanks is singled out for more-expensive emission controls. On the other hand, Anchorage, which has an active conservationist group, may protest being excluded from control.

There are serious doubts about the effectiveness of catalyst systems operating under extreme cold-weather and prolonged-idle conditions, as is common for Fairbanks.

5.2.2.2 Background/Experience Related to Vehicle Control

5.2.2.2.1 Vehicle Registration Control

Alaska registrations have a city and zip code identification. There are no counties in Alaska; sub-state jurisdictional units are called boroughs. Vehicle registration for the Fairbanks North Star Borough comprises about 20,000 light-duty vehicles and about 1500 heavy-duty vehicles. Vehicles new to the state are required to be registered in Alaska within 30 days of establishing residency.

5.2.2.2.2 Safety Inspection Program

The State of Alaska has no vehicle safety inspection program at present.

5.2.2.2.3 Emission Inspection Program

Alaska has no emission inspection program in force. The Fairbanks transportation control plan submitted to EPA includes an inspection and maintenance strategy that is proposed to consist of a simple idle-check and tune-up conducted at 6-month intervals. Reductions of 50 to 60 percent in CO emissions are considered possible by this means. At the present time only visible emissions are actively prohibited. This is enforced by the local police.

5.2.2.2.4 Retrofit Program

Alaska has no retrofit program.

5.2.2.3 Region-Peculiar Factors

Fairbanks' geographical and climatic conditions (low temperature and severe, long lasting temperature inversions) operate to create a long, stable ice-fog condition in winter caused by the aforemention water vapor in the exhaust. Reductions in CO through the use of 1975 catalyst-type control systems will not help the fog problem.

Fairbanks' major pollutant is CO. Other pollutant concentrations may not be high enough to warrant placing Fairbanks in a Class I region category. Both CO and fog could be ameliorated by transportation control strategies such as suggested in the state implementation plans calling for mass transit (Artic Rapid Transit System (ARTS) and restricting VMT by private automobiles in the Fairbanks central business district (CBD).

Also militating against a regional strategy for Fairbanks is the fact that catalyst systems and other emission systems may not function under the extreme low-temperature and sustained-idle conditions that characterize Fairbanks' vehicular operation. Thus, cold weather operation of engines is a problem in itself, and catalyst devices at their present level of development may add to these operating difficulties and ultimately to the pollutant dump due to the possible continuing requirement for extended idling to offset starting problems.

5.2.3 Arizona

Meetings with representatives of the Motor Vehicle and Planning Survey Divisions of the Arizona State Highway Department and with the Division of Air Pollution Control, Arizona State Department of Health, Phoenix, Arizona were held to review the various aspects of the two-car strategy impacting the State of Arizona.

Of particular interest was the Phoenix/Tucson AQCR. This area encompasses five counties; Gila, Maricopa (Phoenix), Pima (Tucson), Pinal, and Santa Cruz. This region comprises 81 percent of the total state population, 84 percent of the passenger cars registered in the state, and accounts for 74 percent of the motor vehicle fuel consumption.

5.2.3.1 Reactions to Two-Car Strategy

Arizona officials indicated that although a regional or air-basin approach to the two-car-strategy option appeared sound from a technical point of view, they would strongly favor a statewide approach from both the political and enforcement point of view. It was pointed out, for example, that over six million out-of-state cars enter Arizona each year, which is over seven times the Arizona passenger-car registration total. Thus, control of out-of-state cars was not considered feasible. By comparison, it has been estimated that approximately 5 percent of the annual registrations are out-of-state cars (see Section 2.3); however, because of the high incidence of out-of-state "visiting" cars, the opinion was expressed that this would delay achievement of the Arizona air quality goals.

5.2.3.2 Background/Experience Related to Vehicle Control

5.2.3.2.1 Vehicle Registration Control

Yearly registration of motor vehicles is mandatory in Arizona. They are currently in the process of converting to a staggered registration system whereby one twelfth of the motor vehicles will be registered each month. Conversion to the staggered system is presently scheduled to be completed by 1974. However, an extension of one year, to 1975, has been requested but not yet approved. Motor vehicle registrations are identified by county in Arizona.

An affidavit of emission control compliance is presently required only for registration of used cars. This affidavit is signed by the dealer on all dealer sales and by the buyer on all private party sales. The state will accept the manufacturer's certification of compliance with Federal standards for registration of new cars.

If the proposed emissions inspection program becomes mandatory (see Section 5.2.3.2.3), compliance would be required as a condition of registration.

Arizona does have reciprocity agreements with bordering states whereby vehicles domiciled within a 25-mile corridor of the state border can be licensed in one state and operated in the other without being registered in the second state.

5.2.3.2.2 Safety Inspection Programs

Arizona does not have a motor vehicle safety inspection program.

5.2.3.2.3 Emissions Inspection Program

The Arizona Department of Health, Division of Air Pollution Control, has been empowered by the State legislature to establish both motor vehicle emission standards and testing methods, procedures, and techniques for possible use in a mandatory emission inspection/maintenance program.

Legislation passed in 1972 allocated $1,000,000 to the Department of Health to establish a pilot emissions testing program. One test station, consisting of two lanes for testing and one lane for research, is scheduled for operation in Phoenix in July 1973. An additional test station is scheduled for Tucson in January 1974.

The Department of Health is currently operating a portable dynamometer in the Phoenix area for evaluating test procedures and standards. Vehicles are tested on the dynamometer at 50, 30, and 0 miles per hour. Testing of privately owned vehicles is currently on a voluntary basis; testing of state-owned vehicles is mandatory. To date, some 5,000 cars have been tested, approximately 35 percent of which have failed to meet the Arizona standards for HC and CO.

Results obtained under the pilot program are to be reported to the State legislature by January 1974. It is expected to be the forerunner of a mandatory emissions inspection/maintenance program. The current legislative climate was said to favor a mandatory program in Phoenix and Tucson by 1975, although the actual enabling legislation has not yet been passed. Program standards and procedures would be established by the Department of Health while the operation, administration, and enforcement would be handled by the Department of Highways, Motor Vehicle Division.

At the present time, some 14 stations are envisaged for Phoenix and 7 to 8 for Tucson. The cost to the state has been estimated at $12,000,000. The cost per test is estimated to be $5 for the first 2 to 3 years and then $2 to $3 after amortization of the capital investment.

5.2.3.2.4 Retrofit Program

Arizona has no retrofit program in force at the present time, although the Department of Health is empowered to certify and require the use of retrofit devices. They have recommended that such devices be tested, but no action has been taken to date.

Arizona may ignore 1967 and older cars with regard to any potential retrofit program, since these are estimated to constitute only 25 percent of the vehicle population by 1975.

It was also indicated that they may have to rule out the vacuum advance-spark disconnect as a retrofit device because of the high ambient temperatures in the Phoenix/Tucson areas.

5.2.3.3 Region-Peculiar Factors

The control of oxidants and CO (8-hour average) constitutes the major problem in the Phoenix/Tucson air basin. The extremely high incidence of out-of-state cars (6.4 million entered the state in 1971) could have a significant impact on achieving the air quality standards in the event a two-car strategy were adopted. Data in Table 5-1 show that approximately 30 percent of all VMT on state highways in Arizona are attributable to out-of-state cars. Within the total Phoenix/Tucson air basin it is estimated that approximately 12 percent of the VMT are attributable to this same source.

Table 5-1. Daily Vehicle Miles on Rural and Urban Systems State of Arizona - 1971

Highway System	System Miles	Rural and Urban Miles Traveled			
		Local Pass.	Foreign Pass.	Comm.	All Vehicles
INTERSTATE	1,220.86				
Vehicle Miles		3,615,178	3,716,966	2,963,158	10,295,302
Average Daily Traffic, Vehicles		2,961	3,045	2,427	8,433
Percent of Interstate		35.11	36.10	28.79	100.00
Percent of All Systems		19.10	19.64	15.65	54.39
PRIMARY	2,020.30				
Vehicle Miles		2,740,511	1,175,766	1,656,755	5,573,032
Average Daily Traffic, Vehicles		1,357	582	820	2,759
Percent of Primary		49.17	21.10	29.73	100.00
Percent of All Systems		14.48	6.21	8.75	29.44
SECONDARY	1,799.68				
Vehicle Miles		1,039,213	368,520	772,300	2,180,033
Average Daily Traffic, Vehicles		577	205	429	1,211
Percent of Secondary		47.67	16.90	35.43	100.00
Percent of All Systems		5.49	1.95	4.08	11.52
STATE ONLY	752.72				
Vehicle Miles		239,168	272,932	367,912	880,012
Average Daily Traffic, Vehicles		318	362	489	1,169
Percent of State Only		27.18	31.01	41.81	100.00
Percent of All Systems		1.26	1.44	1.95	4.65
TOTAL STATE SYSTEM	5,793.56				
Vehicle Miles		7,634,070	5,534,184	5,760,125	18,928,379
Average Daily Traffic, Vehicles		1,318	955	991	3,267
Percent of State System		40.33	29.24	30.43	100.00
Percent of All State Traffic		21.06	15.26	15.88	52.20

Source: Arizona Highways Department, Planning Survey Division

5.2.4 Colorado

A summary of the considerations pertaining to the two-car strategy for the state of Colorado is given below. The information was obtained from the Colorado Department of Health (Air Pollution Control Division) and from the Colorado Motor Vehicle Division (Motor Vehicle Safety Inspection), both located in Denver.

5.2.4.1 Reactions to the Two-Car Strategy

With the present Motor Vehicle Division makeup, the control strategy could only be applied statewide. The political climate is against regional control, even though only metropolitan Denver requires significant rollbacks in oxidant and carbon monoxide pollutants generated by mobile sources.

A 52 percent reduction in carbon monoxide and a 48 percent reduction in hydrocarbon emissions are required to meet Denver objectives. Oxides of nitrogen concentrations do not exceed air quality standards. Even with all automobile emissions meeting Federal standards, there still will be a need in 1977 for additional reductions of 29 percent in carbon monoxide and 18 percent in hydrocarbon. The pollution concentration over Denver is the result of a temperature inversion layer which develops almost every night of the year.

Colorado objects strongly to the mandatory Federal no-tampering regulation pertaining to factory-set carburetion. Difficulties are being encountered by all major car manufacturers in meeting Federal standards at Colorado altitudes. The altitude within the state varies between 3,000 and 10,000 feet. These altitudes require modification of all vacuum-operated devices and special tune-ups to obtain normal autombile operation. So far, Colorado has not obtained an exemption from the Federal no tampering regulation. Both current 1973 cars and 1975-type experimental vehicles with factory-set carburetors are not working properly in Colorado. In addition to poor driveability, the adjustment restriction results in a 60 to 70 percent increase in emissions above sea-level values.

Legislation has not yet been established to implement an automobile emission inspection program. Several proposals are now being debated, but there is little likelihood that any will pass this session. In the past, Colorado's legislature has been very negative with regard to automobile emission controls, particularly with regard to strategies limited to the Denver air basin. The main reason for this is that uncontrolled regions are within 60 miles of metropolitan Denver. It would be easy, for example, for anyone to buy a car outside the Denver area. (A local sales tax of 6 percent has already reduced new car sales in Denver.) Added cost for local emission controls would provide the incentive to buy the car outside the controlled region. Residence addresses provided by the purchaser are not verified and, in any case, a postal box number is an acceptable registration address. One-year implementation of a two-car strategy would have to be based on faith, since state machinery for control could not possibly be developed before 1978.

5.2.4.2 Background/Experience Related to Vehicle Control

5.2.4.2.1 Vehicle Registration Control

Yearly automobile registration is mandatory in Colorado. No special effort is being made to survey registrations except for routine check by police when they stop a car. The state is not equipped to handle actual residence verification and, so far, has had little need for it. Because handling of registration is manual, few statistics are available.

The smallest unit of automobile registration classification is the county. Automobile registration is staggered by month to distribute the workload over the calendar year. New residents must register their car in Colorado within 30 days. No special penalty is imposed on infractions, except that the date of registration is retroactive to the date residence in the state was established. A new car is deemed to have become a used car after its first sale.

5.2.4.2.2 Safety Inspection Program

Colorado's safety inspection program has been in operation since 1950. Safety inspections are conducted by 4,000 state-licensed dealers or garages and are not tied to automobile registration. The inspection is mandatory twice a year, staggered by month. A compliance sticker must be displayed on the windshield. Repairs in the inspecting facility are acceptable. Undercover facility checks are conducted randomly. Standards for the safety inspection are established so as to fail 30 percent of the applicants. Failure, however, can be simply some such maladjustment as, for example, light-beam settings. The car can be impounded for failure to display the safety sticker, and/or a fine of $5 can be imposed for failure to comply. The inspection fee is now $1.50.

To be licensed, mechanics doing the safety inspection must pass a written and practice test at the Motor Vehicle Division. No mechanic is authorized to do the safety inspection without a license.

5.2.4.2.3 Emission Inspection Program

The Colorado legislature has not enacted a law for automobile emission inspections and is not likely to do so this year. However, present plans call for an emission inspection program to be similar to Colorado's highly successful safety inspection program. The same dealers and garages would be expected to handle the emission inspections.

The emission inspection would use the idle-test mode. This is deemed sufficient since control of carbon monoxide is the primary goal. It is believed to be economically unfeasible to do key-mode or similar "functional" tests, since a minimum of 100 dynamometer lanes would be required. Whether the mandatory emissions inspection should be done once or twice a year has yet to be decided. The mechanics would have to be examined and licensed by the Motor Vehicle Division, as in the case of safety inspections noted previously.

Start of the inspection program could not be accomplished before 1978 because of such constraints as obtaining and training necessary personnel and other needs. About 60 people would have to be hired and trained to monitor the program; this is about four times the total personnel now employed for all state environmental work. The total environment budget is currently $700,000, which includes stationary source emissions. Only about $100,000 per year is available for research and studies. Hence, it takes a long time to do any extra planning. Therefore, considering the time for setting standards and licensing mechanics, it would be 1980 before the inspection plan could be fully implemented.

5.2.4.2.4 Retrofit Program

There is no existing law authorizing an emission system retrofit on used cars, and passage of such law is not expected this year.

The EGR plus vacuum-spark-retard has been considered as a possible retrofit system, but no money has been allocated for an in-depth study of the system.

It is believed that the greatest improvement in used car emissions would result from tuning engines to the manufacturer's specifications.

5.2.4.3 Region-Peculiar Factors

Colorado cannot meet the Federal emission standards with automobiles set for a low-altitude environment. A penalty of 60 to 70 percent in exhaust pollutants resulting from the Denver 5,000-feet altitude would result in failure to meet Federal ambient air standards. Furthermore, vacuum-operated devices would be nearly inoperative. Hence, a waiver to the EPA no-tampering regulation must be obtained for satisfactory operation of automobiles in Colorado. All mountain states would face this same problem.

There were 1,179,199 passenger cars registered in Colorado in 1971. Data on the distribution of the car population in the Denver region are provided in Table 5-2.

Table 5-2. Denver Region Car Population Distribution

	Passenger Car Registrations	Percent of State Cars
Adams	99,160	8.40
Arapahoe	95,150	8.10
Boulder	72,959	6.20
Clear Creek	3,219	0.27
Denver	272,577	23.10
Douglas	5,365	0.45
Gilpin	1,126	0.10
Jefferson	144,827	12.30
Denver Air Region	694,383	58.90

There is a market for used Cadillacs in Colorado and many are imported from out-of-state. The large-displacement engine operates well at Colorado's altitudes. However, the Motor Vehicle Division does not keep statistics on the Cadillac population.

5.2.5 District of Columbia

Considerations pertaining to the application of the two-car strategy to Washington, D.C. are summarized below. This information is based on discussions held in Washington, D.C. with personnel from the District of Columbia Department of Environment Services (Bureau of Air and Water Quality Control), the Metropolitan Washington Council of Governments (Department of Health and Environmental Protection), and the D.C. Department of Motor Vehicles (Office of Safety Research).

5.2.5.1 Reactions to the Two-Car Strategy

Personnel in the Bureau of Air Quality Control expressed concern that any consideration might be given to a control strategy which would exclude Washington, D.C. as a stringently controlled region. The D.C. problem is predominantly a mobile source problem, since no industry is permitted in the District. The main difficulty is in meeting the oxidant standard, which requires a 53 percent reduction in HC pollutants. To accomplish this, the District's implementation plan incorporates a number of transportation control strategies (mass transit, retrofit, emission inspection, etc.). All of these plans, however, are predicated upon having new cars that meet 1975 emission standards. Therefore, unless an extension in the schedule for meeting air quality goals were to be granted, D.C. could not tolerate a 1974 emission level car for model year 1975.

The District's problem is shared by other jurisdictions comprising the National Capitol Interstate Air Quality Control Region. These include counties and independent cities in Virginia and two counties in Maryland. No transportation control scheme could be effective without considering traffic within the entire air basin boundary, including the jurisdictions governed by Maryland and Virginia. (It is noted that the Metropolitan Washington regional control strategy was developed on a joint cooperative basis for the three local governments.) Control limited to the geographical area encompassed by the air basin was felt to be administratively unwieldy and, perhaps, totally unenforceable should the price differential between the two classes of new cars be significant. For this reason, it was speculated that Metropolitan Washington control program might involve control of the entire states of Maryland and Virginia in addition to the District of Columbia.

The availability of nonleaded gasoline for trips outside the Washington control region was discussed. The District's transporation plan calls for retrofit of late-model used cars with catalytic converters; however, this proposal was based on the assumption that nonleaded gasoline would be available nationwide because of new car catalyst system requirements in the 1975 model year. In contrast to this situation, the proposed regional control strategy would demand that nonleaded gasoline be made available nationwide solely for the small percentage of stringently-controlled new cars operating outside designated control regions. External-trip distribution data bearing on this problem for the Washington Metropolitan area are shown in Table 5-3.

Table 5-3. 1968 Auto Travel Inside Cordon Area

TYPE OF TRIP	Average Weekday Trips (in thousands)	Percent of Trips	Average Weekday VMT (in thousands)	Percent VMT	Average Trip Length (Miles)
Internal Auto Driver[1]	3,407	92.5	23,443	83.5	6.9
External Auto Driver[2]	277	7.5	4,619	16.5	16.6
Throughs	17	0.5			
Resident	123	3.3			
Non-Resident	137	3.7			
Total	3,684	100.0	28,062	100.0	7.6

[1] Source - 1968 COG/TPB Home Interview Survey

[2] Source - 1968 COG/TPB External (Roadside) Survey

In summary, Bureau of Air Quality personnel felt that a one-year regional control strategy for Metropolitan Washington, D.C. area might be more trouble than it was worth. They would prefer a continuation of 1974 emission standards for 1975 model year cars if accompanied by a one-year or longer extension in the schedule for meeting air quality standards.

5.2.5.2 Experience/Background Related to Vehicle Control

5.2.5.2.1 Vehicle Registration Control

Annual registration in Washington, D.C. is mandatory, and the deadline for registration is March 31. All vehicles except field service vehicles (nationally-mobile elements of the Post Office, Department of Agriculture, military, etc.) are registered, including foreign national, Federal, and District government vehicles (the latter two groups being fee exempt). It may be noted that in most states Federal vehicles are not registered. The nonregistered group comprises less than 2000 vehicles, or less than 1 percent of all cars registered.

Registration is not tied to the D.C. annual safety inspection requirement, which falls on the anniversary of car purchase. License tags are assigned to the registrant and are not transferred with change of vehicle ownership.

Out-of-District vehicles must register in the District within 30 days of establishing residency. There is no overt program to enforce this requirement. The nonresident fraction of new registrations each year is not identified or recorded.

With regard to the two states sharing the D.C. Metropolitan area air basin, Maryland does not register vehicles on a county basis; Virginia registers both with respect to county and independent city, whichever applies. Both states have an annual registration requirement. Virginia now registers on a staggered basis throughout the calendar year. Both state and county license plates are used on Virginia cars. The independent cities have a sticker display, in addition to the state license plate.

5.2.5.2.2 Safety Inspection Program

An annual safety inspection is required for all D.C. passenger cars. Inspection falls on the anniversary of car purchase or on the vehicle's first registration in the District. Taxicabs and school busses are inspected twice a year.

The inspection program is city run and has been in operation since 1939. There are two stations consisting of 4 lanes each. One lane in each station is dynamometer-equipped for emission testing. Enforcement is based on a color-coded and dated windshield sticker. Rejections on first appearance have been running about 40 percent. A one dollar safety check fee is paid on registration.

Safety inspection in the State of Maryland is required only when the vehicle is resold. Virginia has a twice-yearly inspection requirement (proof of inspection is not required for registration). The program is conducted by state-licensed private garages for a two-dollar fee. Valid inspections are identified by a color-coded and dated windshield inspection sticker. One week is provided to make necessary corrections to safety items failing the inspection check.

5.2.5.2.3 Emission Inspection Program

Washington, D.C. does not have a general requirement for emission inspection. At present, only D.C. government vehicles are required to be inspected. These inspections are performed once a year. A pilot program for private vehicles submitted on a voluntary basis is underway. About one percent of the D.C. registered vehicles are checked on this basis.

The inspections are conducted piggy-back to the safety inspection operation. One lane in each of the two safety inspection stations is equipped with a dynamometer and gas analyzer apparatus. The duty cycle used is the Clayton Key Mode (3-speed) cycle. To date, the data scatter from this program is such that it is difficult to determine if the inspection check and subsequent maintenance do any good.

An emission inspection program for all cars registered in the D.C. Metropolitan area has been proposed as part of the regional transportation control strategy for 1975. This program has been approved by the D.C. City Council and the Mayor, and the required budget is included in the D.C. budget that is submitted to Congress. No capital outlay for this program is required; the plan calls for extending the operating hours for the existing inspection stations.

Neither Virginia nor Maryland have an emission inspection program. Virginia is planning to implement an emission program that would be tied to the current safety inspection program administered by the Department of Motor Vehicles.

5.2.5.2.4 Retrofit Program

Currently, there is no retrofit program in force. A coordinated program for retrofitting all vehicles in the Metropolitan Washington, D.C. area has been proposed for adoption in the implementation plans for the District of Columbia, Maryland, and Virginia.

The proposed program would equip all 1968 through 1974 cars with a catalyst system such as the UOP Mini-verter and all pre-1968 cars with a device such as the GM spark-retard system. The Mini-verter is expected to cost about $150 for a V-8 engine; some cars will further require an air pump, involving additional cost. Based on EPA guidelines, the Mini-verter system is expected to reduce HC and CO emissions by 56 percent relative to 1974 exhaust emission standards. Some retrofit exemptions would be permitted, including cars with high-compression-ratio engines.

The proposed retrofit program is under review by the individual governments involved. Approval for the District would require congressional review, even though the City Council nominally has blanket authority to implement emission control programs for the District of Columbia. Neither Maryland nor Virginia has the enabling legislation that would permit such a program to proceed within its jurisdictional areas. The Virginia legislature is presently out of session and does not reconvene until January, 1974; the Maryland legislature adjourns in April. Accordingly, to expect that retrofit for the D.C. Metropolitan area could be implemented in time to meet 1975 air quality objectives appears unrealistic.

5.2.5.3 Region-Peculiar Factors

Though Washington, D.C. is thought to be a tourist city, results of a 1968 travel survey indicate that less than 10 percent of the vehicle miles traveled in the Washington Metropolitan area falls in the fee-exempt registration category. This includes through travel, tourist travel, and travel by diplomatic vehicles. Therefore, the air quality impact of nonresident new car travel into a controlled Metropolitan Washington, D.C. area would appear to be negligible for a one-year program duration.

About 231,000 passenger cars are registered in the District of Columbia; 1,167,000 are registered in the air quality control region. The District issues about 100,000 new titles yearly, of which about 30,000 are D.C. registration transfers. The balance, 70,000 titles or about one third of the D.C. passenger car registration, would appear to be made up of vehicles not previously registered in the District (new registrations). This is an extraordinarily high turnover of the resident car population. It seems possible that the new title statistic may be comprised in part of title transfers from lienholders to owners; therefore it may not be a direct reflection of the number of new resident cars in the District. The new registration fraction from out-of-District is not a statistic that is recorded by the Washington D.C. Department of Motor Vehicles.

Implementation and administration of a regional control strategy in the Washington Metropolitan area is complicated by the requirement to coordinate the program among three local governments. However, the situation is not dissimilar to requirements elsewhere on the east coast: for example, the Philadelphia/New Jersey/New York City region.

5.2.6 Maryland

Two-car strategy considerations for the state of Maryland are given below. This information is based primarily on information obtained in telephone communications with personnel in the Maryland State Department of Health, Bureau of Air Quality Control.

5.2.6.1 Reactions to Two-Car Strategy

Maryland's air quality implementation plan relies heavily upon attainment of 1975 emission standards for 1975 model year cars. A California-only strategy would demand greater reliance on other elements in the state's transportation control strategy, such as reduction of vehicle miles traveled (VMT) by taking cars off the road. For example, if 1975 cars were controlled to 1974 levels, it was estimated that bus ridership in Baltimore would have to be increased by 60 percent over what has been programed (a 160-percent increase over current levels). A 70 percent reduction in HC emissions is needed to meet the oxidant standard in Baltimore.

With regard to a regional rather than a statewide strategy, Maryland's reaction was negative. It was considered simpler to have a uniform control requirement throughout the state. Nevertheless, the problems could be worked out.

False vehicle registration probably would be ignored as a control issue for a one-year program duration.

Controlling only the Washington DC metropolitan region (which includes two Maryland counties) would create problems arising out of conservationist pressures in Baltimore.

Maryland would not be in favor of a permanent two-car strategy. The state would prefer 1975 emission standards or the best Detroit-deliverable emission levels for everybody nationwide.

5.2.6.2 Background/Experience Related to Vehicle Control

5.2.6.2.1 Vehicle Registration Control

Maryland registrations are identified by county and zip code. At the present time, the identification and check of car systems is possible only on transfer of ownership, at which time the law requires a safety inspection as a condition for title transfer.

5.2.6.2.2 Emission Inspection Program

There is no emission inspection program in force. The state's implementation plan calls for a full inspection/maintenance requirement for all vehicles, to be implemented in 1975, although there is no enabling legislation for carrying out this proposed program.

5.2.6.2.3 Retrofit Program

Maryland does not have a retrofit program in force. The state implementation plan proposes a catalyst retrofit for all pre-1975 light-duty vehicles by 1975. There is a bill in the General Assembly that provides the means for enforcing this requirement for all vehicles registered in the state.

5.2.6.3 Region-Peculiar Factors

The Maryland state legislature is in session only three months of each year. This could impact the response time to develop needed laws for implementing two-car strategy enforcement and control procedures.

Control in two Maryland regions could be a consideration: the Baltimore Metropolitan area and the Maryland counties included in the Metropolitan Washington, D.C. region.

Five percent of through traffic in the Baltimore area is from out of state. This is not capable of control, but the impact of the new car fraction on air quality probably could be neglected for a one-year control program.

5.2.7 Massachusetts

Two-car strategy considerations for the state of Massachusetts are outlined below. This information was obtained in telephone communications with personnel in the Massachusetts Department of Public Health, Bureau of Air Quality.

5.2.7.1 Reaction to Two-Car Strategy

A California-only strategy would impact Massachusetts' implementation plans. The state will just about meet CO air quality standards by 1977, without additional transportation control strategies, on the basis that new car emissions conform to 1975 standards. Boston also has an oxidant problem the solution of which is not yet in sight. A VMT-reduction approach does not look promising, although traffic management actions instituted on an episodic or seasonal basis are being considered. An extension in meeting this requirement may be necessary, regardless of the resolution of the two-car strategy issue.

Many problems are foreseen with a regional strategy within the state. Adverse reactions are to be expected from people in the metropolitan area because they will need to accept more expensive cars than will people in the rest of the state.

A Boston-only control region may be subject to question because similar CO problems exist in the Springfield area. One class of low-emission cars is preferred to the proposed strategy.

5.2.7.2 Background/Experience Related to Vehicle Control

5.2.7.2.1 Vehicle Registration Control

Yearly registration is mandatory and is accomplished on a staggered system. Registration may be carried out by mail or by application and fee payment at Registry of Motor Vehicle offices.

Proof of insurance (no-fault) via certification provided by the insurance company is a requirement for registration. There is a large variation between rates of different cities and towns. A false address on insurance can invalidate a company's liability. Nevertheless, many Boston students use home addresses to obtain preferred rates, and other circumventions probably exist. There is no enforcement of this issue by the state; insurance companies perform only spot checks on the validity of addresses provided.

5.2.7.2.2 Safety Inspection Program

Massachusetts has a statewide safety inspection program. The inspection requirement is semi-annual, with deadlines at April 15 and October 15. The inspection is conducted by private garages for a $1 fee. The inspection check is coarse. Valid inspections are identified by windshield stickers. Since there is no real control on the issuance of stickers, however, they are easily obtained.

5.2.7.2.3 Emission Inspection Program

Presently, there is no emission inspection program. The state's implementation plan proposes an emission inspection/maintenance program, with inspection conducted semiannually by stations owned and operated by the state (Registry of Motor Vehicles), and using a loaded (dynamometer) emission test. Valid inspection vehicles would be issued a sticker permitting lawful travel in the state. Enforcement of this program would be carried out by state and local police, although no enabling legislation exists for this program.

5.2.7.2.4 Retrofit Program

There is no retrofit program in Massachusetts, nor is one planned.

5.2.7.3 Region-Peculiar Factors

The CO problem in Boston is bad only in a limited area. Proposed implementation-plan source controls are expected in time to achieve compliance with ambient air standards.

An oxidant problem exists in Boston (0.20 ppm compared with the standard of 0.08 has been measured); however, the incidence of this problem is low. State implementation plans suggest that episodic or seasonal traffic-regulation approaches could avert these situations.

5.2.8 Minnesota

State and regional considerations pertaining to the application of the two-car strategy to Minnesota are summarized below. This information is based on information obtained during telephone communications with the Minnesota Pollution Control Agency, Division of Air Quality Control.

5.2.8.1 Reactions to Two-Car Strategy

The two-car strategy involving California-only control was considered to be a good idea. They cannot see the purpose of applying rigid controls to the Minnesota farmland area.

Minnesota would be strongly opposed to a regional strategy involving Minneapolis. The CO air quality standards are exceeded only in the downtown area and by only 9.5 percent. This problem is expected to disappear in 1976. Accordingly, the 1974 emission standard would be acceptable, since the impact of new car controls on Minneapolis air quality is only 2 to 3 percent. Proposed transportation controls involving VMT in the Minneapolis central business district could be augmented to offset this effect.

5.2.8.2 Background/Experience Related to Vehicle Control

5.2.8.2.1 Vehicle Registration Control

Minnesota has yearly registration which is county-based. Registration identification is not required to be carried in the vehicle or on the person of the owner.

5.2.8.2.2 Safety Inspection Program

There is no safety inspection program in existence, and no such program is proposed.

5.2.8.2.3 Emission Inspection Program

Minnesota has no emission inspection program. It would be impossible to implement such a program within two years.

5.2.8.2.4 Retrofit Program

Minnesota has no retrofit program in force. It is not required at the present time and no program is planned.

5.2.8.3 Region-Peculiar Factors

The state of Minnesota is largely rural. They see no need for a stringently controlled regional strategy, particularly one involving a nonoptimum emission control system.

5.2.9 New Jersey

State and regional considerations pertaining to the two-car strategy as applied to New Jersey are outlined below. This information, in part, summarizes a discussion held in Trenton, New Jersey with a representative of the Bureau of Air Pollution Control, New Jersey Department of Environmental Protection. Additional data were extracted from documents provided at this meeting.

5.2.9.1 Reactions to Two-Car Strategy

New Jersey's major problem areas are Newark and Camden, but the large population centers are so compacted in this state that only a statewide control program could be considered feasible as a minimum. Furthermore, control of New Jersey alone would be difficult, because it is sandwiched between two extremely large population centers in other states, New York City and Philadelphia. The bulk of traffic into and through New Jersey is from these cities. Accordingly, control over a broad interstate region encompassing New York City and Philadelphia in addition to the State of New Jersey would be best from the standpoint of achieving a useful air quality benefit from the control program. However, the possibilities of a grand cooperative effort between the individual state governments involved was felt to be remote.

At present, there is no mechanism for controlling out-of-state registrations by vehicles domiciled in New Jersey. The truck industry, for example, registers vehicles out of state but uses depots within New Jersey. The percentage of New Jersey cars so involved is small at the present time. However, it was felt that this could become a significant problem if there were a large price differential between the two classes of 1975 cars.

5.2.9.2 Background/Experience Related to Vehicle Control

5.2.9.2.1 Vehicle Registration Control

Yearly vehicle registration is mandatory in New Jersey. A valid safety inspection is required in order for registration to remain in force. Yearly registration followed by safety inspection is mandatory in New Jersey and is tied to the anniversary of car purchase. Registrations are not identified by county or by other jurisdictional/geographical regions.

New residents are required by law to register vehicles in New Jersey within six months of establishing residency. However, there is no mechanism for controlling residents from registering vehicles out of state. Border residents continue to renew New York and Pennsylvania registrations because of fee or inspection advantages. This situation is expected to proliferate if the two classes of 1975 cars have a significant cost differential.

5.2.9.2.2 Safety Inspection Program

As already mentioned, a yearly safety inspection is required as a condition for registration in New Jersey. Inspections are staggered over the calendar year on an anniversary-of-car-purchase basis. Inspections are conducted in 40 state-owned and operated stations distributed statewide. With a total of 69 inspection lanes available for use, motorists can select any convenient station.

Inspection time is 5.5 minutes (including a recently instituted emissions check), though waiting on line for durations up to one hour is not uncommon. The safety check includes such items as brakes, ball joints, horns, lights, wipers. A valid inspection is identified by a color-coded and dated windshield sticker. Failures are identified with a red windshield sticker, and violations are required to be corrected within two weeks. Repairs or adjustments can be made at any garage. This has been a source of criticism for the New Jersey safety and emissions inspection program, because it has resulted in much faulty or unneeded repair, adjustment, or replacement work. In this regard, a ping-pong effect has been observed wherein adjustments made to correct safety problems have resulted in a repeat of the failure incident or have resulted in new violations. A state senate investigation of the impact of the program on the motorist is being conducted.

Enforcement of the inspection program is implemented by the state police and meter maids on the basis of checking for the windshield inspection sticker.

5.2.9.2.3 Emission Inspection Program

New Jersey's emission inspection program was started in July, 1972. This is the first state to initiate a yearly inspection requirement limiting HC and CO for all light vehicles in the resident car population. Emission limits have been imposed in three progressive steps becoming effective in 1972, 1974, and 1975. There are different limits for four vehicle age groups: 1967 model year and older, 1968 and 1969 models, 1970 through 1974 models, and 1975 and newer models.

The emission inspection is carried out concurrently with the safety inspection. The added test accounts for an additional 30 seconds of inspection time. Exhaust concentrations of HC and CO are sampled by probe under idle conditions. A loaded test was at one time considered, but was rejected for this first-phase program.

Emission standards for each model-year group will become progressively more severe. At present, the failure rate of the cars tested is about 10 percent. This will increase to a maximum of about 33 percent by 1975.

Strict enforcement with rejection and reinspection will begin in July, 1973. Failure to pass would require the vehicle to undergo a retest after adjustments or repairs were made. At present, repair or adjustment following failure is voluntary.

To date, over one million cars have been tested. Eleven percent have failed the standards at their present level. Forty percent of the failed vehicles voluntarily repaired failed a second time, due apparently to inadequate mechanic training. Beginning in July, failure of either emissions or safety aspects of the inspection will be the basis for denying vehicle registration.

5.2.9.2.4 Retrofit Program

New Jersey does not have a retrofit program in force although the New Jersey transportation control plan incorporates a retrofit strategy. Initially, this strategy would utilize equipment already certified by the state of California.

Statewide control and, preferably, interstate regional control would be necessary to be effective. Furthermore, all vehicles regularly operating within state boundaries would have to be equipped if 1975 controls are to have a beneficial effect on New Jersey's air quality. Enforcement of controls would take the form of tightening emission-inspection-station standards. This would be augmented by road checks of vehicle emissions, similar to California's Passenger Vehicle Inspection (PVI) program. Presumably, citations would be issued to nonresident as well as resident vehicles failing to meet New Jersey standards.

5.2.9.3 Region-Peculiar Factors

New Jersey's passenger vehicle registration comprises 3.26 million cars. This number, compacted in a relatively small geographical area, gives New Jersey the greatest density of autos in the nation. In addition to the vehicle miles traveled (VMT) by resident cars, an overwhelming VMT contribution is made by traffic moving into and through New Jersey from the New York City and Philadelphia metropolitan areas. Of this, truck traffic dominates.

These factors suggest that an interstate regional control scheme would be needed for the New Jersey area. Eighty-eight percent of New Jersey cars, along with much of the traffic that regularly enters from out of state, would be accounted for by a control region consisting of the Metropolitan Philadelphia Interstate and the New Jersey/New York/Connecticut AQCRs.

5.2.10 New York

State and regional considerations pertaining to the two-car strategy as applied to New York are summarized below. This information was obtained in discussions held in New York City and Albany with personnel from the New York City Bureau of Technical Services (Department of Air Resources), the New York State Department of Environmental Conservation (Division of Air Resources), and the New York State Department of Motor Vehicles (Division of Research and Development).

5.2.10.1 Reactions to the Two-Car Strategy

The New York City reaction primarily reflected concern over the severe CO problem which exists in the midtown area of Manhattan and emphasized the deleterious effect on air quality which would result from compromising the 1975 exhaust emission goals. Sixty percent of the VMT in midtown Manhattan are made by taxis (there are 12,000 Medallion[1] taxicabs in the city). Approximately 50 percent of the Medallion cab fleet consist of vehicles only one year old (see Table 5-4) while the overall Manhattan new-car population comprises 21 percent of the total (see Table 5-5). These factors translate into a significant CO emissions penalty for the midtown Manhattan area should 1974 rather than 1975 emission standards be used in New York's 1975 model-year cars. Thus, the position taken by the New York City people was that it is imperative that the New York Metropolitan area be a controlled region. The area of control, it was felt, could practically be confined to the New York metropolitan and surrounding regions (New York City, Nassau, Suffolk, Westchester and Rockland counties).

New cars from uncontrolled regions taking residency in New York was considered to be a potentially significant issue if a program longer than one year's duration were to be proposed. In this case, a retrofit requirement might be instituted.

Circulation of nonresident cars into the control region could also be neglected if the program were to be one year in duration. This position was supported by personnel from the State Division of Air Resources. For a longer program, deterrants such as a city day-use tax, monitored at the various bridge and tunnel crossings, might be employed. Regardless of program duration, however, the problems of implementing and administering the control scheme were anticipated to be enormous, particularly for the regional control option.

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[1] Medallion cabs are those which have purchased a license to cruise the streets. Non-Medallion cabs are restricted to answering calls for taxi service.

Table 5-4. Taxicab Population - Percent by Year New York City

Age, yr	Fleet Medallion	Non-Fleet Medallion	Non-Medallion
1	50	17	5
2	45	31	11
3	5	21	17
4	-	18	23
5	-	7	20
6	-	3	10
7	-	2	7
8	-	0.5	4
9	-	0.3	2
10 or older	-	0.2	1

Table 5-5. Percent Passenger Car Population New York City

Age, yr	Manhattan	Bronx	Brooklyn	Queens	Richmond	Midtown	Downtown
1	21.3	10.8	10.2	12.8	10.1	22.0	20.0
2	18.9	13.8	13.1	14.0	13.0	23.0	28.0
3	12.6	11.4	11.5	12.1	11.5	21.0	17.0
4	8.7	9.2	9.5	9.8	9.4	11.0	10.0
5	8.2	9.9	10.5	10.4	10.4	8.0	7.0
6	7.9	10.7	11.2	10.6	11.0	7.0	3.0
7	6.1	9.4	9.1	8.3	9.2	4.0	5.0
8	5.4	8.5	8.3	7.4	8.1	2.0	4.0
9	3.9	6.4	6.1	5.4	6.4	0.8	3.0
10	2.5	3.9	4.0	3.4	4.1	0.7	2.0
11 or older	4.5	6.0	6.4	5.8	6.8	0.5	1.0

State Department of Environmental Conservation personnel added the commentary that the regional control scheme would be acceptable if it were the only practical route toward achieving the 1975 Federal exhaust emission standards. In addition to New York City, other cities in the state might also be evaluated as candidates for stringent control. Schenectady's CO problems were mentioned as one possible area for consideration.

Though the regional strategy appeared to present many administrative difficulties, it was emphasized that the regional approach made more sense from the standpoint of cost and effectiveness than statewide control.

In the opinion of DMV personnel, the mechanics of identifying cars complying with resident-vehicle emission control requirements would be simple. For example, it could be accomplished simply by use of a windshield sticker. Such a device is being considered for use in connection with proposed retrofit programs included in the New York transportation control strategy. The use of vehicle identification numbers (VINs) to assist in validating appropriately equipped cars was questioned. It was estimated that 30 percent of DMV files were in error, primarily with respect to the VINs.

5.2.10.2 Background/Experience Related to Vehicle Control

5.2.10.2.1 Vehicle Registration Control

Registration yearly is a requirement in New York, and is staggered throughout the calendar year, and is implemented by mail invitation from Albany. Registration is not classified by county; however, the address of record is used as the basis for disbursing tax revenues to the county level. Applications are processed by local DMV registrars (70 locations) and the data are transmitted to a central computing and filing facility in Albany.

The DMV uses the registration address primarily for the purpose of mailing renewal applications. There is no law that prevents a person from not identifying the domicile of the vehicle, from giving an address that is not his residence, or from giving an address that is not the operating arena of the vehicle. Rental and state cars, for example, are frequently registered in one city or county and operated elsewhere.

Preconditions for New York registration include proof of vehicle safety inspection (both new and used cars), proof of ownership, proof of insurance, and proof of identity and date of birth. A renewal of a vehicle previously registered requires proof of insurance and the current registration stub, which indicates that a valid inspection was performed. Valid resident registrations are identified by a color-coded, license-tag sticker containing a printed expiration date. In New York, the registrant transfers license tags from vehicle to vehicle.

Concerning new cars, New York does not issue temporary registrations as does, for example, California. The vehicle cannot be legally driven until registration papers are obtained from the DMV. This is frequently done by the dealership; however, there is no legal requirement for the dealer to handle the registration details for the customer.

Out-of-state cars are required to register in New York within 60 days from establishing residency in the state. There is no active program to enforce this requirement.

5.2.10.2.2 Safety Inspection Program

New York's state safety inspection program has been in operation since 1956. Every motor vehicle registered in the state is required to be inspected yearly and/or upon transfer of ownership. The inspection is conducted by 11,000 licensed and state-supervised stations. New York City alone has 2400 of these official stations.

A certificate of registration which agrees with the vehicle license plate number and which correctly describes the vehicle to be inspected must be presented to the station before inspection can proceed. The safety check encompasses brakes, steering, headlamps, auxiliary lights, tires, wipers, windshield and other safety items. The inspection fee is $3, part of which is returned to the state for financing a special police enforcement and inspection group which also investigates alleged malpractices.

On successful completion of the inspection, a color-coded and dated inspection certificate is issued which is displayed on the windshield. In the event of an inspection failure, a certificate of rejection is issued and a certificate of inspection extension is put on the windshield. In this case, corrective action must be taken within 10 days.

Inspection is a condition for registration. In the case of vehicles registering from out of state, a valid inspection certificate from the state of previous residence is accepted. On expiration of this certificate, the vehicle must be inspected in New York and must bear an official certificate of inspection from a New York inspection station.

5.2.10.2.3 Emissions Inspection Program

New York does not have an emissions inspection program. Existing legislation provides for emissions inspection to be added to the existing safety inspection program as soon as a practical plan has been defined by the DMV, in consultation with the Commissioner of Environmental Conservation. This plan has not been promulgated.

New York's transportation control strategy includes the establishment of an emissions inspection program that would provide for 800 state-operated or state-franchised inspection stations statewide, 140 of which would be located in the New York Metropolitan area. Inspection would be required once a year for passenger cars, twice a year for heavy-duty vehicles, and three times a year for taxicabs.

5.2.10.2.4 Retrofit Program

There is no retrofit program in force in New York State. The air quality implementation plan calls for all light duty vehicles registered in 1974 in the Metropolitan Area to be retrofitted with catalytic converters and air pumps (3.3 million vehicles). In all other areas of the state, where necessary, an intake air-bleed system would be installed on all pre-1968 cars. In addition to light-duty vehicles, retrofit devices for heavy-duty vehicles are proposed for the New York Metropolitan area.

Emissions inspection is regarded to be a crucial adjunct to the proposed foregoing retrofit programs. The existing DMV authority for an inspection program tied to safety inspection is considered inadequate and must be extended to provide for state-run or franchised inspection stations.

Viewed realistically, the retrofit program is regarded to be unmanageable in the time period available for its implementation. Accordingly, New York may request an extension for meeting the oxidant standard.

5.2.10.3 Region-Peculiar Factors

Of the 6.1 million passenger cars registered in New York State; 1.6 million are registered in New York City; and 3.3 million vehicles, or over 50 percent, are registered in New York City Metropolitan area consisting of New York City and the surrounding counties of Nassau, Suffolk, Westchester and Rockland. About half of the total car population in the New York/New Jersey control region are contained in the New York City area.

As previously stated, the Manhattan problem is CO, particularly in the Midtown area. A large percentage of the Manhattan car population consists of new vehicles (21 percent). Manhattan Medallion taxicabs, which account for 60 percent of the downtown/midtown vehicle miles traveled (VMT) and 40 percent of the CO emissions, contain a very high fraction of new cars (50 percent of fleet and 17 percent of nonfleet Medallion taxis are one year old or newer). For this reason, an extension of 1974 standards in the New York area would have a serious impact on expected improvements in overall ambient CO levels.

About 4.6 percent of New York City registrations, or 75,000 cars per day, enter the city from outside the metropolitan area. With regard to the Manhattan CO problem, the uncontrolled new-car fraction of this influx would have a negligible effect, considering that only 15 percent of the midtown VMT is contributed by passenger cars.

New York's oxidant problem is bad citywide. HC is 20 to 50 times the level needed to achieve Federal oxidant standards. These probably will not be met in 1975, because proposed transportation control strategies targeted toward this problem (e.g., retrofit) cannot be implemented in the time available. Therefore, it appears that the issue of uncontrolled new cars entering New York may be academic insofar as it determines whether or not 1975 air quality goals are met for either HC or CO.

5.2.11 Oregon

State and regional considerations pertaining to the two-car strategy for the state of Oregon are highlighted below. This information was obtained in interviews conducted at Portland and Salem with personnel from the Oregon Department of Environmental Quality (Air Quality Control Division) and from the Oregon Motor Vehicle Division (Administrative Services and Traffic Safety Programs).

5.2.11.1 Reactions to the Two-Car Strategy

From the standpoint of both popular reaction and control enforcement, Oregon would rather adopt statewide than regional automobile emissions controls. On the other hand, downtown Portland is the only area within Oregon requiring automobile emissions control to meet air quality standards. A rollback of 25 percent in oxidants and carbon monoxide is needed to satisfy secondary requirements. Oxides of nitrogen are not a problem.

The EPA has defined five air basins in Oregon: Portland, Northwest, Southwest, Central, and Eastern. The Portland air basin is interstate and contains the Washington State counties of Clark, Scamania, Cowlitz, Lewis, and Wahkiakum. Oregon prefers to divide the state into 14 administrative regions that are more closely related to air pollution sources. For example, the Portland air basin contains 3 administrative divisions of which only the Columbia/Williamette air region (Portland) would be significant in a two-car strategy. In fact, all studies have shown that control of vehicle emissions are needed only in 3 counties: Multnomah, Washington, and Clackamas. They contain 40 percent of the state vehicle registrations. Road surveys have shown that 85 percent of the Portland city traffic originates within these 3 counties.

Enforcement of the control strategy could be implemented statewide by the process of demanding compliance prior to issuing or renewing license plates. However, regional controls would be very difficult to police within the existing framework of state laws and regulations. Development of new legislation for this purpose is unlikely within the time remaining until 1975. Also, some public support is bound to be lost if only some regions are selected for stiffer automobile emission standards (Portland had a very poor experience with an automobile safety inspection program that had been restricted to metropolitan Portland only). However, implementation of a 3-county mandatory plan would generate less overall resistance than a control program for the entire Portland basin, which contains 10 counties that are mostly rural. A decision to control the entire state or only some counties is likely to be a political one and would be hotly debated by the legislature.

Any automobile emissions control scheme that would be expensive for local residents runs the risk of being foiled by the simple expendency of buying the car in an uncontrolled area. Distances between Portland and rural areas are very short. There are no existing laws in Oregon which would forbid a dealer in an uncontrolled region to sell a car to a resident of a controlled region. Nor can a dealer be forced to check the residence of a customer or to add emission control devices without the expressed consent of the customer. Such laws are unlikely to be favored by the legislature. In addition, it would be perfectly legal to establish residence in an uncontrolled area by the expediency of renting a mailbox address.

One-year implementation of a two-car strategy would have little impact on Oregon's air quality. In 1972, there were 1,361,203 passenger cars registered in Oregon, of which only 105,000 passenger cars were new. This is less than 8 percent of the state's total passenger car population.

5.2.11.2 Background/Experience Related to Vehicle Control

5.2.11.2.1 Vehicle Registration Control

Yearly automobile registration is mandatory in Oregon. The registration process and statistics are computerized and are handled by the Motor Vehicle Division at Salem. The workload is evenly distributed by the use of a monthly, staggered statewide registration process. Residence location is entered in the computer by zip code, rather than by county, because it has been found that, although zip codes are not quite in agreement with county lines, they result in much fewer errors than the use of the declared county of residence. People know their zip code better than they know the county in which they reside. The county is the smallest political entity under statistical control.

No efforts are being made to verify residence information. It is felt that the "benefit" to be derived from license application verifications does not warrant the required added cost. In case of regional automobile emission controls, the added load of residence verification could not be handled with present personnel and budget. It is perfectly legal in Oregon to use a business address or a postal box number on the license renewal application. This address need not agree with the address on the driver's license, and new residents need not register their car until their out-of-state registration expires. There were 103,311 new-to-Oregon passenger cars registered in 1962; a used car is defined as a car previously licensed.

5.2.11.2.2 Safety Inspection Program

There is no safety inspection program in Oregon.

5.2.11.2.3 Emission Inspection Program

There is no emissions inspection program in force. The Department of Environmental Quality has the authority to set emission standards and to implement an inspection program, but it has no money to carry out this program. The budget is being debated in the legislature, and there is little likelihood that funds would be allocated this session.

State plans call for a state-controlled emission inspection program. This inspection would be required in order to obtain a certificate of compliance and complete the license renewal. Thus, the inspections would be staggered over the calendar year. The emission tests would be based on the key-mode test cycle. The fee would range between $5 and $7.50. The proposed effectivity of the program is 1 January 1974, with mandatory repairs starting 1 January 1975. The minimum permissible emission standards will be based on 1974 calendar year inspection results and on a rejection rate not yet determined.

Although only a 3-county inspection program is justifiable, it might be easier to implement a statewide program. To this effect, 25 inspection facilities, run by the Oregon Motor Vehicles Division, would be distributed over the state of which 6 would have 2 lanes, 19 would have 1 lane, and 4 would be mobile installations. It is planned that the inspection facilities will be installed on abandoned gas station sites. Repairs would not be handled by inspection facilities but could be done anywhere. Retest of vehicles would be handled free of charge.

Public lobbying has been against mandatory automobile maintenance as opposed to mandatory inspection and in favor of state-run inspection facilities.

5.2.11.2.4 Retrofit Program

Nothing has been decided on retrofit kits for used cars. The California retrofit program will be watched closely, but it is felt that none of the existing devices justify enough confidence to proceed with a mandatory retrofit program at this time.

The Oregon legislature does not appear receptive to a mandatory "add-on" for used cars. It is believed that car maintenance to factory specifications would suffice to meet the objectives of the Oregon implementation plans.

A complication concerning regional control would be the sale of used cars from uncontrolled regions into controlled regions. The question is whether these cars should be retrofitted to the standard of the controlled region. Enabling legislation would be very difficult to obtain.

5.2.11.3 Region-Peculiar Factors

Oregon is largely rural, with only metropolitan Portland requiring abatement of automobile emissions. Traffic surveys have shown that 85 percent of the downtown Portland traffic originates within the three adjacent counties. The Federal Portland basin comprises 10 Oregon counties and 5 Washington counties, of which only three contribute significantly to Portland's air pollution from mobile sources.

There were 1,361,203 passenger cars registered in Oregon in 1972. The distribution of cars in the Portland region is shown in Table 5-6. Surveys have shown that only 6 percent of the downtown Portland traffic originates in the five Washington counties included in the AQCR.

Table 5-6. Portland Region Car Population Distribution

Counties	Passenger Car Registrations	Administrative State Regions	Percent of State
Clackamas	11,508	District 2	
Multnomah	329,017		
Washington	105,086		
Columbia	19,633	565,244	41.53
Marion	95,886	District 3	
Polk	21,342		
Yam Hill	26,722	143,950	10.58
Benton	28,103	District 4	
Lincoln	17,309		
Linn	47,744	93,156	6.84
Portland Air Region (Oregon)	802,350 (1972)	802,350	58.94

5.2.12 Pennsylvania

State and regional considerations pertaining to the two-car strategy for the State of Pennsylvania are summarized below. The information given was obtained in interviews conducted in Harrisburg, Pennsylvania with personnel from the Pennsylvania Department of Environmental Resources (Division of Air Resources) and the Department of Transportation (Bureaus of Traffic Safety and Motor Vehicles).

5.2.12.1 Reactions to the Two-Car Strategy

In general, neither the California-only nor the California-plus strategy options were acceptable to Pennsylvania. The California-only strategy was rejected because of the impact that 1974-level new car emissions would have on Pennsylvania's air quality implementation plans. In this regard, there are two major metropolitan areas of concern, Pittsburgh and Philadelphia. These two metropolitan areas account for 50 percent of the state's automobile population. Presently planned transportation controls needed to meet air quality goals in these areas call for extension additions to or modifications of mass transit facilities to reduce vehicle miles traveled (VMT) in the central business districts. These include extension of the subway system in Philadelphia, dedicated freeway/highway bus lanes in both cities, and a new rapid transit system in Pittsburgh.

The automobile VMT reductions needed in 1975, primarily to meet the CO ambient air quality standard, are 30 percent for Pittsburgh and 50 percent for Philadelphia. Plans to institute disincentives for automobile travel in the central business districts include parking bans, restrictive parking rates, and restrictive tolls on bridges in the Philadelphia area. These VMT reductions are predicated on having new cars in the automobile population that are controlled to 1975 emission standards. On any other basis, the percentage of VMT reductions needed to meet air quality goals would increase. The present reduction requirements are considered difficult, if not impossible, to attain by 1975.

With regard to regional control of the Pittsburgh and Philadelphia areas, the reactions were wholly unfavorable because of the problems foreseen in developing the necessary state legislation and in administering the program on a local basis. Surveilling and enforcing the sale of properly equipped vehicles to residents in the regions of control was regarded to be impossible to deal with. Statewide control was felt to be a more satisfactory approach, although from the standpoint of achieving desired air quality goals, it would be necessary to extend the region of control to encompass five New Jersey counties in the Metropolitan Philadelphia Interstate air-quality-control region. This would help in reducing the total VMT by less-stringently controlled cars from typical out-of-state sources.

5.2.12.2 Background/Experience Related to Vehicle Control

5.2.12.2.1 Vehicle Registration Control

Yearly registration is mandatory in Pennsylvania. The registration process is wholly handled by the Bureau of Motor Vehicles (BMV) facility in Harrisburg, which processes all registration applications by direct mailing. There is no jurisdictional breakdown of registrations below the state level. Any valid address within the state may be submitted for registration purposes, regardless of where the vehicle is domiciled or operated. This address is used solely for mailing and law enforcement purposes. There are no BMV data which permit automobile population distribution within the state to be determined. Where required, these data have been estimated on the basis of population statistics. There are no local BMV offices except for temporary facilities recently established in a pilot program designed to test the handling of peak registration mailings, which occur as the March 31 registration deadline is approached.

Registration is not tied to Pennsylvania's existing safety inspection program; valid inspection is not a requirement for registration (the Bureau of Motor Vehicles and the Bureau of Traffic Safety operate independent programs). Renewal registrations are identified by color-coded license plate stickers. Pennsylvania transfers license plates from vehicle to vehicle.

Out of state vehicles are required to register within 30 days of establishing residency in the state. There is no overt program to enforce this requirement. It is not legal to register out of the state while residing in the state. However, Pennsylvania permits the renewal of registration by residents living out of state.

5.2.12.2.2 Safety Inspection Program

Pennsylvania's safety inspection program has been in operation for about 20 years. The inspections are conducted by 17,000 privately owned, state-licensed stations, representing a major portion of Pennsylvania's garage facilities.

Safety inspection is required twice a year. The safety check appears to be quite comprehensive. A complete check takes about 45 minutes. There is no legal limit on the fee charged; this is normally regulated by competitive pressures to about $5.

Vehicles passing the safety inspection are issued color-coded and date-limited windshield inspection stickers. Safety deficiencies may be corrected anywhere; inspection is repeated until the vehicle passes inspection.

Inspection station operations are monitored by the state police through the mechanism of unscheduled inspection checks made twice yearly. The penalty for malpractice is $200 for each violation in addition to possible loss of certification status. Mechanics are required to undergo recertification training and to qualify for recertification by test every 3 years. Pennsylvania is attempting to upgrade their mechanics in anticipation of continuing growth in the complexity and number of vehicle systems impacting safety. The task is a massive one because of the large number of personnel involved. Certified mechanics in Pennsylvania number 80,000.

5.2.12.2.3 Emission Inspection Program

Pennsylvania does not have an emission inspection program at this time. A number of emission inspection alternative were examined as part of the overall state transportation control strategy. Of these, the most cost-effective approach was determined to be a state-operated program limited to the Philadelphia and Pittsburgh areas. The inspection scheme under consideration consists of an engine parameter check, involving plugs, timing, idle RPM, and possibly CO emissions.

Some pressure against a state-operated system is expected to be exerted by the operators of the many existing safety inspection stations, in view of the fact that existing legislation empowers the state to institute an emissions inspection program tied to the existing safety inspection program. However, the feeling is that emissions should be separated from safety and should be conducted and controlled by the state to avoid the proliferation of unnecessary repair and parts replacement incidents. At the present time, there is no authority empowering the state to establish state-operated facilities or to geographically circumscribe an emissions inspection program.

With regard to existing legislation, an act passed by the Pennsylvania General Assembly provides for a statewide, semiannual, control-device inspection program which would be tied to the existing safety inspection operation. A definitive plan and schedule for implementing this program was to have been defined by the State Secretary of Transportation. At present there are no vehicle code regulations pertaining to this plan, and no deadline for developing these regulations has been selected.

5.2.12.2.4 Retrofit Program

Pennsylvania does not have a retrofit program. Retrofit was considered as a strategy for the state's transportation control plan, but it was rejected because the anticipated technical difficulties in implementing the program were regarded to be insurmountable and because legislation needed to promulgate and successfully sustain a retrofit program was not available.

5.2.12.3 Region-Peculiar Factors

The following region-peculiar factors apply to the Pennsylvania situation:

a. The automobile population is about 5.3 million cars,

b. 50 percent of all automobiles in the state are located in two metropolitan areas, Philadelphia and Pittsburgh,

c. 95 percent of the VMT in the Pittsburgh metropolitan area and in the Philadelphia Interstate Region are made by vehicles domiciled in these areas,

d. Philadelphia receives a large percentage of its traffic from nearby population centers in New Jersey.

The high concentration of automobiles in the two population centers supports the contention that 1975 new-car emission levels would have an impact on air quality in these areas. Nevertheless, this problem may be overshadowed by local CO emission concentrations created largely by adverse traffic conditions in the central business districts of these metropolitan areas. The proximity of Philadelphia to population centers in neighboring states suggests that an interstate control region encompassing possibly the State of New Jersey along with Philadelphia and the Metropolitan New York area would be required, if the air quality benefits from 1975 emission-level cars are to be realized.

5.2.13 Texas

The state and regional considerations regarding the two-car strategy in Texas were reviewed with representatives of the Texas Air Control Board; the Texas Air Pollution Service, Texas Health Department; the Texas Department of Public Safety; the Texas Highway Department; and a representative of the New Car Dealers Association, in Austin, Texas.

The state of Texas has a total of 12 AQCRs. The designated regions for the purposes of this study are: the Houston-Galveston area and the southern Louisiana/southeast Texas interstate area, which includes 15 Texas counties and 39 parishes in Louisiana.

5.2.13.1 Reactions to the Two-Car Strategy

It was indicated that both the Houston/Galveston and southeast Texas/southern Louisiana air basins are predominantly stationary source problem areas. Because of the severe HC problem, however, existing air quality implementation plans would be compromised if emission inventories could not take advantage of 1975 automobile emission levels.

It was further stated that a one-year delay in the introduction of the 1975 emission standards might require the implementation of both mandatory inspection/maintenance and retrofit programs. However, since specific enabling legislation would have to be passed to fully implement such plans, serious doubts were expressed regarding the availability of sufficient lead time to meet the 1975 or 1977 air quality standards.

The opinion was also expressed that since a two-car strategy would slip their air quality control program, there should be a parallel relaxing of the air quality standards.

5.2.13.2 Background/Experience Related to Vehicle Control

5.2.13.2.1 Vehicle Registration Control

Yearly vehicle registration is mandatory in Texas, but it is primarily a tax collection process with no special means for enforcement.

Registration is not tied in to Texas' existing safety inspection program; valid inspection is not a requirement for registration.

Any changes in the vehicle identification number (VIN) for the purpose of aiding vehicle identification in the event a two-car strategy is introduced would require the Department of Motor Vehicles' computer software changes (which might be possible) as well as additional personnel (and dollars) for enforcement where none is budgeted at the present time.

No registration controls are imposed on the sale of either new or used cars with regard to emissions controls.

5.2.13.2.2 Safety Inspection Program

The Texas Safety inspection program has been in operation since 1951. The inspections are conducted by privately owned, state-licensed stations under the administration of the Department of Public Safety. This inspection is not tied to vehicle registration.

The safety inspection is conducted annually on a staggered basis and includes a visual inspection to ensure that the original emissions control equipment has not been removed or altered. No emission tests are conducted.

5.2.13.2.3 Emissions Inspection Programs

No emissions inspection program is in effect in Texas at the present time. Federal law provisions constitute the only control on new car sales. With regard to new car sales, it was pointed out that there are many interdealer exchanges within the state prior to the first sale, which could impact the regional approach to the two-car strategy.

A similar situation exists with regard to used cars, where major wholesaling occurs both within and out-of-state, depending on specific demands at a given time. No used-car emission controls exist at the present time, although, as pointed out above, the state safety inspection program does include a visual inspection to ensure that the original emission control equipment has not been removed or altered.

House bill 238, currently in committee, would provide for studies only to be made of candidate mandatory inspection/maintenance programs. The state view is generally negative toward such programs.

The legal authority for inspection and testing exists in section 3.10(d) of the Texas Clean Air Act, although further legislation would be required to fully implement such a plan.

5.2.13.2.4 Retrofit Program

No retrofit programs are in existence or contemplated in Texas. Although legal authority for retrofit is contained in the Texas Clean Air Act, no enabling legislation has been passed.

5.2.13.3 Region-Peculiar Factors

Approximately 4.6 million passenger cars were in operation in Texas as of 1 July 1972. Approximately 20 percent are located in the Houston AQCR while 4.6 percent are located in the Texas portion of the Texas/Louisiana AQCR.

The state of Texas has reciprocity agreements with bordering states which allow out-of-state car owners domiciled within a certain number of miles of Texas to work and drive in Texas without registering or licensing; similar rights exist for Texas residents in bordering states.

The entire state was reported to have an HC problem. Predominantly stationary source problem areas include the Houston-Galveston area (18 percent due to autos), the southeast Texas/southern Louisiana area (5 percent due to autos), and the Corpus Christi area. Mobile source problem areas were reported to include Austin/Waco; Dallas/Ft. Worth; San Antonio/El Paso.

5.2.14 Utah

State and regional considerations pertaining to the state of Utah were discussed via telephone communication with representatives of the Air Quality Section of the Utah State Division of Health.

The Salt Lake City Air Quality Control Region is composed of five counties: Davis, Morgan, Salt Lake, Tooele and Utah. Weber county, situated immediately north of Salt Lake County, is not within the AQCR, but it was also reported to have a mobile-source pollution problem of greater magnitude than in sparsely populated Tooele and Morgan counties within the AQCR. Those counties within the AQCR constitute about 68 percent of the state population, while Davis, Salt Lake, Utah, and Weber counties were reported to include 80 percent of the state population.

5.2.14.1 Reactions to the Two-Car Strategy

The California-only, two-car strategy option was acceptable to Utah since this option was expected to have a minimal effect on air quality.

Conversely, however, they did not feel that the California-plus option was acceptable. The reasons for rejecting the idea of a regional approach were based on the fact that the people of Utah were not too excited about automotive pollution problems, with the result that adverse reactions could be expected if the Salt Lake City AQCR was included in the regional two-car strategy.

Also, the auto pollution problem is one of CO in the six-square mile area of the central business district of Salt Lake City. They have examined a type of two-car strategy for this area and concluded that it would be impossible to administer.

In addition, further problems were anticipated if Weber County (not in the AQCR), having a higher auto pollution than Tooele County (within the Salt Lake City AQCR), was allowed higher emitting automobiles.

5.2.14.2 Background/Experience Related to Vehicle Control

5.2.14.2.1 Vehicle Registration Control

Yearly registration is mandatory in Utah. Vehicle registrations are identified by both county and community, although they have no way to keep track of the cars once they are registered.

Registrations are not tied to Utah's existing safety inspection program; valid inspection is not a requirement for registration.

5.2.14.2.2 Safety Inspection Program

Utah's safety inspection program has been in operation for about 35 years. The inspections are conducted by privately owned, state-certified inspection stations and are administered by the Highway Department.

The safety inspection is required annually on a staggered basis as a function of the last digit of the license plate. The fee is $3.25, of which $0.25 goes to the state.

As previously pointed out, a valid safety inspection is not a requirement for registration. Proof of ownership is required, however, as a part of the safety inspection.

5.2.14.2.3 Emissions Inspection Program

No emissions inspection program is in effect in Utah at the present time. Enabling legislation was passed by the state legislature at the last session, but no specific plans have been made.

A visible emissions monitoring program is being conducted by the Air Quality section (rather than the enforcement agencies). This program, conducted on a low level of effort basis, is directed primarily toward trucks in an attempt to get corrective action.

5.2.14.2.4 Retrofit Program

Utah has no retrofit program in effect at the present time, although plans for such a program are contained in the state implementation plan. If instituted, the program could be accomplished within the framework of the emissions inspection legislation.

The primary goal of any retrofit program was reported to be directed toward the reduction of CO for 1966/74 model year cars.

5.2.14.3 Region-Peculiar Factors

Utah has a small population (approximately 1,000,000) which is concentrated in a few areas. Thus, a large area of the state is essentially unpopulated, including Morgan and Tooele counties within the AQCR.

The only air pollution problem in Morgan county was reported to be from a cement plant.

The only problem present in Tooele county arises from the fact that many people live in Salt Lake City who work at Dugway Proving Ground in Tooele County.

5.2.15 Washington State

Information on the state and regional considerations pertaining to the two-car strategy for the state of Washington was obtained via telephone contact with the State Department of Ecology, Technical Assistance Division.

The state of Washington encompasses all or portions of three AQCRs covered in this report. Four counties comprise the Seattle region; seven counties in Washington together with five in Idaho make up the Spokane AQCR; and five Washington counties are included in the Portland, Oregon AQCR. The Seattle region contains approximately 56 percent of the passenger cars in the state. The Washington portions of the Spokane and Portland regions contain 12 percent and 8 percent of the cars, respectively.

5.2.15.1 Reactions to the Two-Car Strategy

In general, neither the California-only nor the California-plus strategy options were acceptable to Washington. The California-only strategy would impact their air quality program, since the automotive pollution problem is primarily one of reducing CO in the central business districts of Seattle (55 percent reduction) and Spokane (48 percent reduction). The extent of the reduction is predicated upon the 1975 emission inventories from automobiles and must be increased by some other means should the 1975 standards be relaxed.

With regard to the regional approach, they have examined various control strategies for King County (Seattle) and Spokane County (Spokane) only, since the political climate is generally unfavorable for special controls in the other counties of the state. They did feel that Seattle and Spokane must have common controls.

5.2.15.2 Background/Experience Related to Vehicle Control

5.2.15.2.1 Vehicle Registration Control

Yearly registration is mandatory in Washington. Registrations are identified by county, although the state does not have any follow-up program to verify that the vehicle is actually domiciled at the address of registration.

5.2.15.2.2 Safety Inspection Program

The state of Washington discontinued their safety inspection program approximately 20 years ago. Current feelings are negative toward restoring such a program.

5.2.15.2.3 Emissions Inspection Program

Washington does not have an emissions inspection program at present, although a bill is pending to implement one. This bill, however, would call for inspection in King (Seattle) and Spokane (Spokane) counties only. The question on whether this program would be privately or state-operated is still open.

5.2.15.2.4 Retrofit Program

No retrofit program is in effect in Washington. It was further indicated that the state legislature is not willing to introduce any retrofit legislation.

5.2.15.3 Region Peculiar Factors

As previously pointed out, a 55 percent reduction in CO is required in Seattle and a 48 percent reduction is required in Spokane. Because of strong reactions against control in the rural areas and counties other than those containing Seattle and Spokane, the legislature was said to be unlikely to vote for rigid controls outside of these two counties.

It was also pointed out that many non-Seattle residents buy cars in Seattle because of lower prices. The introduction of a regional two-car strategy could impact both marketing trends and regional control problems.

SECTION 6

VEHICLE USER EFFECTS

The low-emission and higher-emission 1975 new car classes will differ in a number of characteristics including emission control equipment, cost, and operations. Many of these differences are not yet known in detail, primarily because they will be affected by policy decisions that have not as yet been made. The following sections discuss possible differences between the two types of cars and their likely effects on the vehicle user.

6.1 TWO-CAR HARDWARE AND COST DIFFERENCES

If 1975 Federal standards are to be met in the controlled region, the new 1975 low-emission car will require as a minimum some kind of catalyst system to reduce CO and HC emissions. Depending upon the type and performance of the catalyst system selected, such equipment as the intake manifold, carburetor, cylinder head, and ignition system may be either physically different or have different permanent settings or calibrations. The desirability of retrofitting higher-emission 1975 cars that move permanently into controlled regions will be greatly affected by the type of catalyst emission control system selected. Conversely, a requirement that retrofit be technically and economically feasible could affect catalyst emission control system selection. For example, if both car classes had engine and emission control systems that were identical in components except for the catalytic converter, per se, and perhaps its air diversion control system, then not only would retrofit be more feasible but also the cost differences between the car classes would be minimized.

Initial cost differences between the two car classes will depend upon the hardware differences, as noted, and also on the car pricing policies followed by the auto companies. Several pricing policies are possible, including:

a. Low-emission car sold at full cost of emission control system differences

b. Cost increases distributed over all cars

c. Catalyst control system treated as a "mandatory option" for the low-emission car.

The actual cost differences between the cars will determine the extent of likely evasion of the two-car strategy by 1975 model new car buyers and therefore influence the cost of enforcement.

6.2 OPERATIONAL AND MAINTENANCE DIFFERENCES

Based on the ground rules of this study both cars will have the same NO_x level and therefore about the same fuel consumption characteristics. Also, basic maintenance costs should be similar for both vehicles in terms of tuneups, etc. However, the reliability of catalyst systems is of great concern and is one of the main reasons auto firms support strategies that will permit a "pilot" program prior to nationwide use. While consumers would be protected by the new car catalyst system warranty, if repairs under this warranty become significant, the auto companies will undoubtedly pass this cost on to consumers through increased initial costs and parts and labor prices. If serious warranty-recall problems did arise the car dealers could get swamped and not be able to render effective service and repair.

6.3 ABILITY TO MOVE FROM AREA TO AREA WITH GIVEN CAR

Depending upon the policy decisions made and the extent of enforcement, owners of the higher-emission 1975 cars may find that if they permanently move into a controlled region, they may be required to retrofit or sell their car. Whether this situation will, in fact, occur is dependent upon the final regulations generated for controlling the area of new car sales and regulations for used cars in the control region. Since annual migration of cars into possible control regions is normally a small fraction (< 5 percent) of the total number of cars within the region, forced sale or modification of the higher-emission cars may be an unreasonable requirement.

6.4 RESALE CAPABILITIES

Since car migration is small relative to the total number of cars in a region, most new 1975 cars will likely be sold in their area of original purchase. Therefore, for most sales, there would be no loss in value even for low-emission cars with catalyst systems. However, sales of such cars outside of controlled regions would likely result in loss of the extra cost of the catalyst system (e.g., just as air conditioners lose value in cold regions).

If higher-emission new cars are permitted in controlled regions as used cars without retrofit after the one-year, two-car strategy is completed, such cars could undersell the low-emission cars. This could create a strong demand within the controlled region for higher-emission used cars from outside the region and make difficult the resale of low-emission cars.

Large fleets and leasing companies may experience some financial difficulties, because cars assigned to controlled regions would have to be sold in these regions as used cars to prevent loss in value of the catalyst system. Normally, fleet and lease cars are sold wherever there is a market, and many times they are sold outside the area in which they initially operated.

6.5 IMPACT OF REGISTRATION REQUIREMENTS

Generally no impact is foreseen unless inspection and/or maintenance or retrofit is required as a prerequisite to registration. However, if these requirements are not imposed, then increased migration of higher-emission cars into controlled regions may occur for economic reasons, as mentioned above.

In particular, if the initial price of the higher-emission car is much less than the low-emission car, some owners may purchase, register, and/or license higher-emission cars out of the state or out of the control region, then bring such a car into the control region as a used car.

6.6 IMPACT OF RETROFIT REQUIREMENTS

If retrofit of higher-emission cars brought into a controlled region on a permanent basis is required, various results are possible:

- If the policy is not effectively enforced and the costs are high, many owners would be encouraged to violate the laws requiring retrofit.
- If the cost of retrofit is high relative to the value of the car, owners of higher-emission cars will likely sell them prior to moving and purchase another car for use in the controlled region. The replacement could be a new car or even a pre-1975 used car. Used cars might be particularly interesting if they could be operated without installation of additional emissions control devices.
- If the ability to retrofit a higher-emission car is a requirement levied on the auto makers, the initial cost of such cars might be increased to cover the costs of retrofit for those cars potentially requiring it. This could result in both car classes being nearly the same in emission-control-system configuration except for the catalytic converter.

6.7 ABILITY TO ACQUIRE REPLACEMENT PARTS AND SERVICE

Difficulties may be encountered by owners of low-emission cars in areas outside the controlled region in obtaining replacement parts (24-hour delays likely). In addition, service in such areas from mechanics with little experience with catalyst systems may be of poor quality.

According to the auto companies contacted, parts and service within controlled regions should offer no problems.

6.8 ABILITY TO ACQUIRE UNLEADED GASOLINE ON TRIPS OUTSIDE OF CONTROL REGION

Low-emission cars require unleaded gasoline for proper operation of their catalyst system. Present Federal regulations call for unleaded gasoline to be available throughout the nation by July 1974.

However, if for any reason (such as the fact that it is uneconomic for stations to stock a fuel for which there is little demand), unleaded gasoline would not generally be available outside of controlled regions, several approaches would be possible:

a. The catalyst system could be designed with a bypass that would be adjusted for use prior to a trip outside the controlled region and closed upon return to the region. To avoid widespread use of the bypass within the controlled region, device adjustments and legal approvals by the state or local regional control authorities would likely be required.

b. For short periods of time, leaded gasoline may not permanently degrade catalyst materials; therefore, in emergency situations use of such gasoline may be allowed. However, the extent of catalyst degradation would be unknown unless a testing and inspection program for such cars were established.

c. For the few trips that most people would make outside of controlled regions, the use of higher-emitting rental cars may be desirable, and perhaps should be encouraged. In a number of situations, such rental cars could provide better service at lower cost than using the low-emission family car with a catalyst that requires unleaded gasoline and special parts and service.

6.9 SUMMARY

It appears that users of low-emission 1975 cars will have higher initial and operating costs and more difficulties in resale than owners of higher-emission 1975 car models, unless specific policies are implemented to ameliorate these burdens. Policies that would lessen the difference between initial cost of the vehicles and the cost to retrofit higher-emission cars that move into controlled regions on a permanent basis would help the cost and resale problems of low-emission cars.

SECTION 7

COROLLARY ISSUES

7.1 IMPACT ON USED CAR INDUSTRY

The effect on the used car industry would be determined largely by the differential between the initial price of high- and low-emission cars and the cost involved should retrofit be required of higher-emission cars that move permanently to controlled regions:

a. If the cost differences are large and retrofit is required, most new cars would be traded and sold in the region of initial purchase or traded between similar regions. There would be little incentive for selling low-emission cars outside control regions, because the extra initial cost of their catalyst system would be lost on such sales, while the retrofit requirement would likely increase the initially lower cost of higher-emission cars to a level where there would be no cost savings to the purchaser.

b. If cost differences are large, and retrofit is not required, there would be a strong incentive to sell the lower-cost, higher-emission cars in controlled regions. It may be difficult to resell low-emission cars unless the extra cost of their catalyst system is absorbed as a loss.

c. If cost differences between cars are small and retrofit is required, higher-emission cars would be pretty much restricted to sales outside of controlled regions. The cost of retrofitting such cars for sales in controlled regions would make them more costly than low-emission cars.

d. If cost differences between cars is small and retrofit is not required, migration of low- and higher-emission cars would be pretty much as it is today for used cars, with customer preference determining the movement of cars.

7.2 IMPACT ON REPLACEMENT PARTS INDUSTRY

It is expected that initially there would be no impact, with dealers providing parts from auto makers and original-equipment suppliers. However, if, over a period of time, low-emission cars require a high volume of replacement parts to maintain proper operation, new suppliers may enter the market.

SECTION 8

APPENDIXES

APPENDIX A

COMPANY/AGENCY VISITS AND CONTACTS

Date of Visit	Company/Agency Name	Personnel Contacted
7 March 1973	American Motors (meeting and letter reply)	R. A. Peterson--Director, Advanced Power Plants and Research Engineering D. L. Hittler--Manager, Emission Development
27 March 1973	Chrysler (telecon)	Mr. S. L. Terry - Vice President Office of Public Responsibility Environmental and Safety Relations
8 March 1973	Ford Motor Company (meeting and letter reply)	J. U. Damian--Manager, Vehicle Noise Programs G. H. Anderson--Section Supervisor, Emissions Control Dept. C. B. Kirkpatrick--Systems Planning and Development Dept. D. Manly--Sales M. Lynch--Sales D. Melville
9 March 1973	General Motors Corporation (meeting and letter reply)	E. E. Nelson--Assistant Director, Automotive Emission Control E. C. Henricks--Service Section D. Burnette--Emissions Reliability and Manufacturing, Buick Division
27 March 1973	International Harvester (telecon only)	Mark Sherbinsky
29 March 1973	American Honda Motor Co., Inc. (letter reply on marketing aspects only).	J. M. Murray, Automobile Sales Manager

Date of Visit	Company/Agency Name	Personnel Contacted
6 April 1973	Mercedes Benz of North America, Inc. (telecon and letter reply)	K. H. Faber, Engineering Planning Manager Bernard Steinhoff
26 March 1973	Nissan Motors (meeting at Aerospace Corp.)	Hiroyuki Maruoka, Engineering Representative, Nissan Motor Co., Ltd.
30 March 1973	Toyota Motor Sales, U.S.A., Inc. (telecon and letter reply)	Dan N. Koda, Executive Assistant, Service
2 April 1973	Volkswagen of America (telecon only)	Hans Weisbarth, Manager, Emissions and Development
6 March 1973	Motor Vehicle Manufacturers Ass'n. (meeting)	Mr. Rowe Mr. Fry
6 March 1973	R. L. Polk Co. (meeting and correspondence)	Mrs. Ellen Huber, Account Executive
27 and 28 March 1973	Alaska, Department of Environmental Conservation (telecon and data)	Thomas R. Hanna, Supervisor, Air Quality Control Division Tim Gilmore, Engineer, Air Quality Control Division James Anderegg
20 March 1973	Arizona, Department of Health	Arthur Aymar, Director, Division of Air Pollution Control R. Bruce Scott, Chief, Service Evaluation Section
	Arizona, Highway Department (meeting and data)	R. Campbell, Superintendent Phil Thorneycroft, Deputy Superintendent Ray Johnson, Staff, Planning Survey Division

Date of Visit	Company/agency Name	Personnel Contacted
16 March 1973	California, Air Resources Board (Sacramento)	John Maga, Executive Officer William Simmons, Legal Council
	California, Dept. of Motor Vehicles	Elmer Brown, Registrar, Division of Registration Quinton E. Peters, Staff, Division of Registration
	California, Highway Patrol	Capt. W. A. Fradenburg, Commercial Vehicles Section, Headquarters
13 March 1973	California Air Resources Board (El Monte)	G. C. Hass, Chief of Vehicles Emissions Control
16 March 1973	California - Department of Finance (meeting and data)	I. Hambright
21 March 1973	Colorado, Air Pollution Control Division	Don Sorrels, Chief, Technical Services and Evaluation Section
	Colorado, Motor Vehicle Division (meetings and data)	Richard Love, Head, Motor Vehicle Safety Inspection
28 March 1973	Maryland, State Department of Health and Mental Hygiene, Bureau of Air Quality Control (telecon and data)	Donald Andrew, Chief, Mobile Source Section

Date of Visit	Company/Agency Name	Personnel Contacted
28 March 1973	Massachusetts, Department of Public Health (telecon)	Gilbert T. Joly, Director, Bureau of Air Quality Bill Cass
29 March 1973	Minnesota, Pollution Control Agency (telecon and data)	Dr. John Olin, Deputy Director, Air Quality Division
22 March 1973	New Jersey, Department of Environmental Protection (meeting and data)	John Elston, Staff, Bureau of Air Pollution Control
23 March 1973	New York City, Bureau of Technical Services, Department of Air Resources	Brian Ketchum, Director, Office of Planning and Implementation Raymond Maurice, Deputy Director Daphne Gemmill, Staff
	New York State, Department of Environmental Conservation, Division of Air Resources	John K. Hawley, Chief, Mobil Service Section Donald H. Miller, Associate Economist, Division of Air Resources Mike Stawarz, Staff
	New York State, Department of Motor Vehicles (meetings and data)	Charles W. Bostick, Director, Division of Research and Development Barry M. Hecht, Department of Transportation

Date of Visit	Company/Agency Name	Personnel Contacted
20 March 1973	Oregon, Department of Environmental Quality	H. M. Patterson, Director, Air Quality Control Division R. Householder, Supervisor, Motor Vehicle Section R. Jasper, Staff
	Oregon, Highway Department, Motor Vehicle Division	Harvey B. Ward, Director Administrative Services Donald M. Stuhr, Director, Traffic Study Programs
	(meetings and data)	
21 March 1973	Pennsylvania, Department of Environmental Resources, Bureau of Air Quality and Noise Control	Gary L. Triplett, Chief, Division of Air Resources, Management and Research V. Ramadass, Chief, Planning and Development Section, Division of Air Resources Management and Research
	Pennsylvania, Department of Transportation, Bureau of Traffic Safety	Ward Baumbauch, Chief, Inspection Division
	Pennsylvania, Department of Transportation, Bureau of Motor Vehicles	Harry M. Scrignoli, Assistant to the Director, BMV Frank L. Pinola, Jr., Chief, Accounts Division, BMV
	(meetings and data)	

Date of Visit	Company/Agency Name	Personnel Contacted
21 March 1973	Texas, Air Control Board	Ken Wade
	Texas, Department of Health	Fred H. Hartman, Engineer, Air Pollution Control Services
	Texas, Department of Public Safety	Joe D. White, Inspector, Motor Vehicle Inspection and Planning Division
	Texas, Highway Department, Motor Vehicle Division (meetings and data)	James L. Keithly, Staff Services Assistant Edgar Burkhart, Chief, Accounting Mr. Davidson, Representative, New Car Dealers Association
29 March 1973	Utah, Division of Health (telecon and data)	Dr. Grant Winn, Chief, Air Quality Section Casper A. Nelsen, Engineer, Air Quality Section
29 March 1973	Virginia, Air Polution Control Board (telecon)	James Alexander, Staff Member Frank Osequeda, Staff Member
28 March 1973	Washington State, Department of Ecology (telecon and data)	Henry Droege, Supervisor, Technical Assistance Division

Date of Visit	Company/Agency Name	Personnel Contacted
20 March 1973	Washington, D.C., Environmenta Health Administration, Department of Environmental Services	John Brink, Chief, Bureau of Air and Water Quality Control S. Singh Bajwa, Engineering and Planning Division
	Washington, D.C., Metropolitan Washington Council of Governments, Department of Health and Environmental Protection	David Dijulio Head, Air Quality Section Sydney Berwager, Senior Transportation Engineer
	Washington, D.C., District of Columia Department of Motor Vehicles (meeting and data)	Wiley W. Godsey, Chief, Office of Vehicle Safety Research Harry Gray, Chief, Data Process Processing

APPENDIX B

OUTLINE OF MAJOR ELEMENTS OF INTEREST IN CURRENT STUDY ENTITLED, "Examination of the Issues Related to Two-Car Regional Emission Control Strategy Options/Alternatives"

B.1 Identification/Synthesis of Control Strategy Options[1]

Candidate options include:

a. Use of low-emission[2] cars in State of California only (all other States use higher-emission[3] cars).

b. Use of low-emission cars in State of California and selected metropolitan areas and/or basins (all other States and/or areas use higher-emission cars).

Candidate metropolitan areas[4] and/or basins for selection to use low-emission cars include (in addition to State of California):[5]

a. Houston, Texas

b. Phoenix/Tucson, Arizona

c. Southern Louisiana and Southest Texas

d. Boston, Massachusetts

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[1] Options wherein a low-emission car is utilized in a region where automobile emissions are the dominant air pollution problem, and a higher-emission car is utilized in regions where permitted by air quality conditions.

[2] Low-emission cars conform to 1975 Federal emissions standards.

[3] Higher-emission cars conform to 1973/74 Federal emissions standards.

[4] Metropolitan areas encompass those associated counties in "Standard Metropolitan Statistical Areas" as published by the Executive Office of the President/Bureau of the Budget.

[5] These areas and/or basins are subject to changes as the study progresses.

e. Philadelphia, Pennsylvania
f. Portland, Oregon
g. Fairbanks, Alaska
h. Baltimore, Maryland
i. New York City, New York
j. Spokane, Washington
k. Denver, Colorado
l. Washington, D.C.
m. Pittsburgh, Pennyslvania
n. Seattle, Washington
o. Minneapolis/St. Paul, Minnesota
p. Salt Lake City, Utah

The time frame for the two-car control strategy options is the 1975 model year.

B.2 Car Population Identification and Effects Analysis

Determination of the distribution of cars within the United States:

a. By state registration location for control strategy option 1a.

b. By area registration location (including county level breakdown) for those areas of control strategy option 1b.

Determination of new-car sales distribution as in 2a and 2b above.

Determination of the relative movement of cars from state-to-state, or from area-to-area, as in 2a and 2b, in order to determine the potential number of higher-emission cars that might enter low-emission-control regions either on a permanent or transient basis.

B.3 Identification of Administrative Measures Related to Compliance Assurance

Identify candidate measures/techniques related to control strategy compliance assurance and assess possible effectiveness and/or ramifications. Typical candidate measures/techniques include:

a. Vehicle registration control

b. Control of new car deliveries to dealers

c. Inspection of cars (both regional periodic inspection and incoming checkpoint inspection)

d. Retrofit requirements for higher-emitting cars when permanently entering a controlled region.

B.4 Control Strategy Feasbility Analysis

Assessment of the feasibility of implementing a two-car strategy, for the strategy options 1a and 1b, from the standpoint of industry, the Government, and the vehicle user.

Typical auto industry considerations include:

a. Ability to produce two classes of new cars

b. Ability to market new and used cars, including distribution effects in low- vs high-emission controlled regions

c. Ability to service (parts and repair) both vehicle classes.

Typical government considerations (Federal/State/Local) include:

a. Ability to implement, in a timely manner, the compliance-assurance measures/techniques identified in 3a through 3d.

Typical vehicle user effects include:

a. Two-car hardware and cost differences

b. Operational and maintenance differences

c. Resale capabilities

d. Impact of retrofit requirements

e. Registration requirements

f. Inspection requirements (regional control).

Typical oil industry considerations include:

a. Ability to distribute and market leaded and unleaded gasoline, as required by the control strategy options 1a and 1b.

B.5 Corollary Issues Assessment

Identification of the more significant "pro's" and "con's" of a number of issues potentially attendant to the implementation of control strategy options 1a and 1b. Candidate corollary issues include:

a. Marketing impact on car producers. The impact of the control strategy on the ability to market cars nationwide.

b. Impact of other potential requirements such as:
   1. The requirement to produce lesser-controlled cars capable of retrofit
   2. The requirement to have lower-emitter controls as optional features in other areas.

c. Impact on auto production rates such as:
   1. Overseas deliveries of domestic producers
   2. Number of foreign cars imported
   3. Balance-of-trade ramifications.

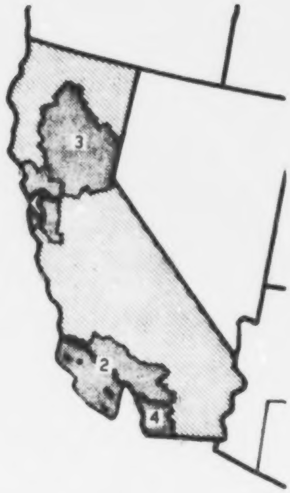
d. Other impacts on the consumer, such as:
   1. Ability to acquire replacement parts and service
   2. Ability to move from area to area with a given car
   3. Ability to acquire unleaded gasoline (if required) on trips outside of a control region.

e. Impact on replacement parts industry, in terms of ability to meet customer demands.

f. Impact on used-car industry with relation to flow of cars from area to area, under the control strategy options 1a and 1b.

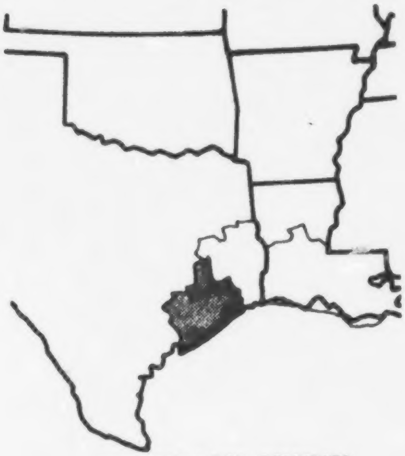
APPENDIX C

POPULATION AND PASSENGER CARS IN USE WITHIN EACH STATE AND AQCR



AIR QUALITY CONTROL REGIONS	POPULATION	PASSENGER CARS REGISTERED
1 SAN FRANCISCO BAY AREA AIR BASIN (9 Counties)	4,500,000	2,125,000
2 SOUTH COAST AIR BASIN (6 Counties)	9,700,000	4,860,000
3 SACRAMENTO VALLEY AIR BASIN (14 Counties)	1,382,000	565,000
4 SAN DIEGO AIR BASIN (1 County)	1,358,000	640,000
TOTAL	16,940,000	8,190,000
REST OF STATE	3,013,000	1,154,000
STATE TOTAL	19,953,000	9,344,450
U.S. TOTAL	203,235,298	86,438,957
REGIONS % OF STATE	85	87.50
REGIONS % OF U.S.	8.35	9.47
STATE % OF U.S.	9.85	10.81

Figure C-1. Car Registrations, California

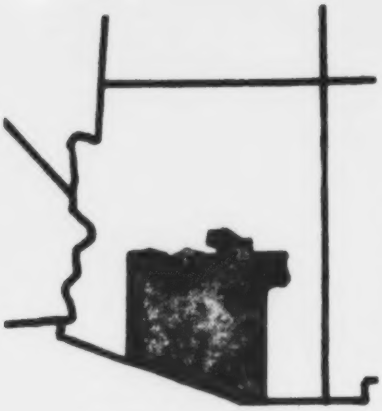


	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	2,305,000	957,191
STATE TOTAL	11,197,000	4,617,455
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATE	20.6	20.72
REGION'S % OF U.S.	1.0	1.11
STATE'S % OF U.S.	5.5	5.34

INCLUDED COUNTIES

1 AUSTIN
2 BRAZORIA
3 CHAMBERS
4 COLORADO
5 FORT BEND
6 GALVESTON
7 HARRIS
8 LIBERTY
9 MATAGORDA
10 MONTGOMERY
11 WALKER
12 WALLER
13 WHARTON

Figure C-2. Car Registrations, Houston, Texas Region

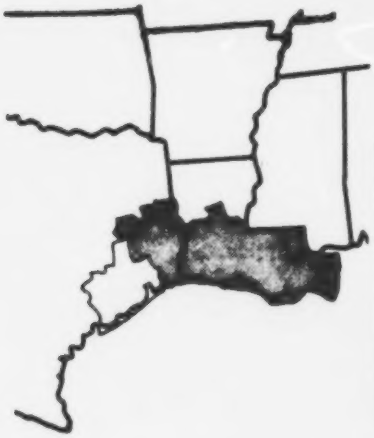


	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	1,429,000	714,849
STATE TOTAL	1,711,000	842,893
U.S. TOTAL	203,235,000	86,438,957
REGIONS % OF STATE	80.50	84.80
REGIONS % OF U.S.	0.70	0.83
STATES % OF U.S.	0.87	0.98

INCLUDED COUNTIES

1 GILA
2 MARICOPA
3 PIMA
4 PINAL
5 SANTA CRUZ

Figure C-3. Car Registrations, Phoenix/Tucson Region

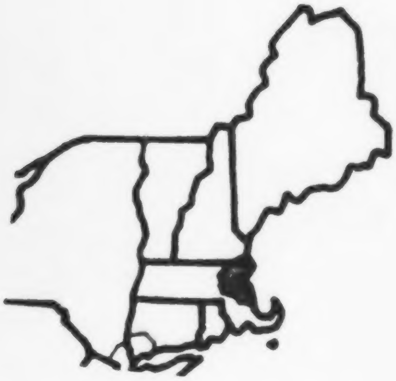


	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	3,360,000	(212,686) TEXAS (1,007,564) LA 1,220,250 TOTAL
STATE TOTAL (Texas + La)	11,197,000 3,641,000 14,838,000	(4,617,455) TEXAS (1,323,596) LA 5,941,051 TOTAL
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATES	22.10	20.54
REGION'S % OF U.S.	1.65	1.41
STATES' % OF U.S.	7.30	6.87

INCLUDED COUNTIES

- TEXAS/15 COUNTIES
- LOUISIANA/39 PARISHES

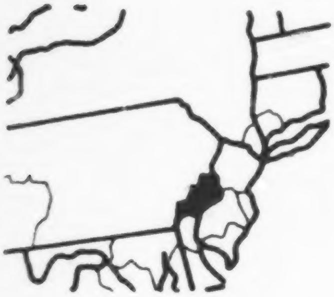
Figure C-4. Car Registrations, Southern Louiasiana/ Southeast Texas Region



	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	3,375,000	1,269,686
STATE TOTAL	5,689,000	2,228,662
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATE	59.5	56.97
REGION'S % OF U.S.	1.66	1.47
STATES' % OF U.S.	2.8	2.58

INCLUDED COUNTIES
1 ESSEX
2 MIDDLESEX
3 NORFOLK
4 SUFFOLK

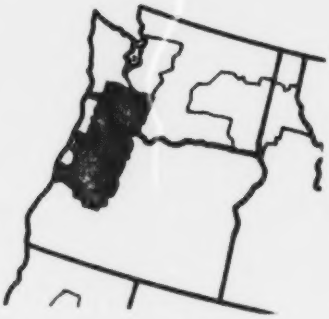
Figure C-5. Car Registrations, Boston, Massachusetts Region



	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	3,844,000	1,422,557
STATE TOTAL	11,794,000	4,690,633
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATE	32.6	30.33
REGION'S % OF U.S.	1.9	1.65
STATES' % OF U.S.	5.8	5.43

INCLUDED COUNTIES
1 BUCKS
2 CHESTER
3 DELAWARE
4 PHILADELPHIA
5 MONTGOMERY

Figure C-6. Car Registrations, Philadelphia, Pa. Region



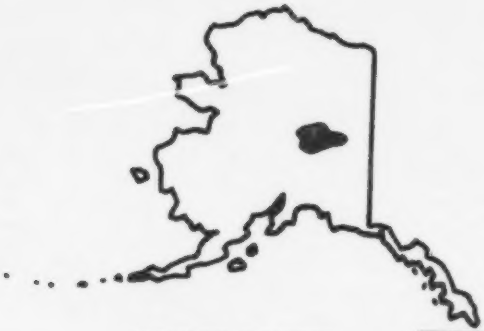
INCLUDED COUNTIES

OREGON
1 BENTON
2 CLACKAMAS
3 COLUMBIA
4 LANE
5 LINN
6 MARION
7 MULTNOMAH
8 POLK
9 WASHINGTON
10 YAMHILL

WASHINGTON
1 CLARK
2 COWLITZ
3 LEWIS
4 SKAMANIA
5 WAHKIAKUM

	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	1,727,000	806,928
STATE TOTAL (Ore. + Wash.)	2,091,000 3,409,000 5,500,000	(963,936) ORE (1,515,485) WASH 2,479,421 TOTAL
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATE	31.40	32.55
REGION'S % OF U.S.	0.85	0.93
STATES' % OF U.S.	2.70	2.87

Figure C-7. Car Registrations, Portland, Oregon Region



INCLUDED COUNTIES
1 CENTRAL DISTRICT

	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	45,000	13,908
STATE TOTAL	300,300	101,724
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATE	15	13.67
REGION'S % OF U.S.	0.22	0.0161
STATE'S % OF U.S.	0.148	0.118

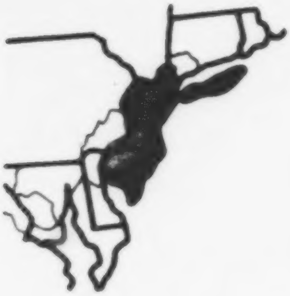
Figure C-8. Car Registrations, Fairbanks, Alaska Region

INCLUDED COUNTIES

1 ANNE ARUNDEL
2 BALTIMORE CO
3 BALTIMORE CITY
4 CARROLL
5 HARFORD
6 HOWARD

	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	2,070,000	860,779
STATE TOTAL	3,922,000	1,488,071
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATE	53	57.85
REGION'S % OF U.S.	1.02	1.00
STATE'S % OF U.S.	1.93	1.72

Figure C-9. Car Registrations, Baltimore, Md. Region



INCLUDED COUNTIES

NEW YORK

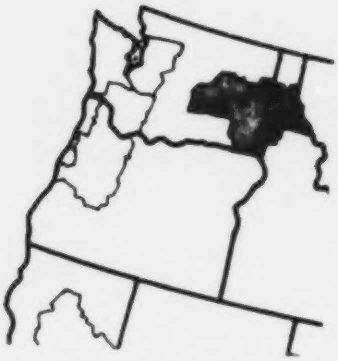
1 BRONX
2 KINGS
3 NASSAU
4 NEW YORK
5 QUEENS
6 RICHMOND
7 ROCKLAND
8 SUFFOLK
9 WESTCHESTER

NEW JERSEY

ALL 21 COUNTIES IN STATE

	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	18,736,000	6,717,371
STATE TOTAL (NY + NJ)	18,237,000 7,168,000 25,405,000	(6,224,601) NY (3,260,464) NJ 9,485,065 TOTAL
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATES	73.5	70.82
REGION'S % OF U.S.	9.2	7.77
STATES' % OF U.S.	12.5	10.97

Figure C-10. Car Registrations, New York City/New Jersey Region

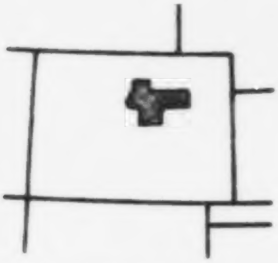


INCLUDED COUNTIES

WASHINGTON	IDAHO
1 ADAMS	1 BENEWAH
2 ASOTIN	2 KOOTENAI
3 COLUMBIA	3 LATAH
4 GARFIELD	4 NEZ PERCE
5 GRANT	5 SHOSHONE
6 LINCOLN	
7 SPOKANE	
8 WHITMAN	

	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	526,000	232,237
STATES TOTAL (Wash. + Idaho)	3,409,000 713,000 4,122,000	(1,515,485) WASH. (308,769) IDA 1,824,254 TOTAL
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATE	12.80	12.73
REGION'S % OF U.S.	0.26	0.27
STATE'S % OF U.S.	2.02	2.11

Figure C-11. Car Registrations, Spokane, Wash. Region



INCLUDED COUNTIES

1 ADAMS
2 ARAPAHOE
3 BOULDER
4 CLEAR CREEK
5 DENVER
6 DOUGLAS
7 GILPIN
8 JEFFERSON

	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	1,241,000	653,773
STATE TOTAL	2,207,000	1,091,215
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATE	56.00	59.91
REGION'S % OF U.S.	0.61	0.76
STATES' % OF U.S.	1.09	1.26

Figure C-12. Car Registrations, Denver, Colorado Region

Md
WASH. D.C.
Va

INCLUDED COUNTIES

MARYLAND

1 MONTGOMERY
2 PRINCE GEORGES

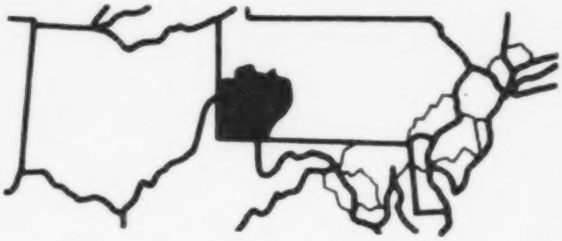
VIRGINIA

1 ARLINGTON
2 ALEXANDRIA
3 FAIRFAX
4 LOUDOUN
5 PRINCE WILLIAM

DISTRICT OF COLUMBIA

	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	2,940,000	1,167,419
STATES TOTAL (Md + Va)	3,922,000 4,648,000 756,000 9,326,000	(1,488,071) MD (1,804,603) VA (369,325) D.C. 3,661,999 TOTAL
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATES	31.50	31.88
REGION'S % OF U.S.	1.44	1.35
STATES' % OF U.S.	4.60	4.24

Figure C-13. Car Registrations, Washington, D. C. Region

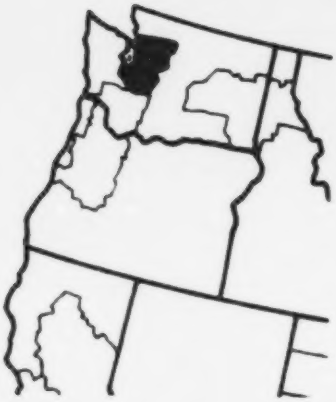


INCLUDED COUNTIES

1 ALLEGHENY
2 ARMSTRONG
3 BEAVER
4 BUTLER
5 FAYETTE
6 GREENE
7 INDIANA
8 WASHINGTON
9 WESTMORELAND

	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	2,876,000	1,099,225
STATE TOTAL	11,794,000	4,690,633
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATE	24.2	23.43
REGION'S % OF U.S.	1.41	1.27
STATES' % OF U.S.	5.8	5.43

Figure C-14. Car Registrations, Pittsburgh, Pa. Region

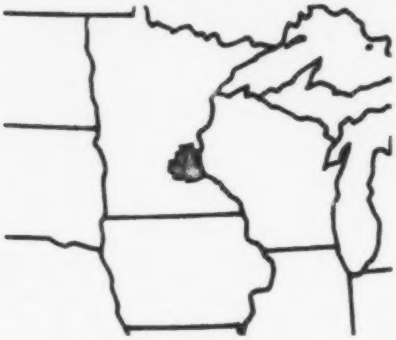


	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	1,933,000	852,526
STATE TOTAL	3,409,000	1,515,485
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATE	56.7	56.25
REGION'S % OF U.S.	0.95	0.99
STATE'S % OF U.S.	1.68	1.75

INCLUDED COUNTIES

1 KING
2 KITSAP
3 PIERCE
4 SNOHOMISH

Figure C-15. Car Registrations, Seattle, Wash. Region

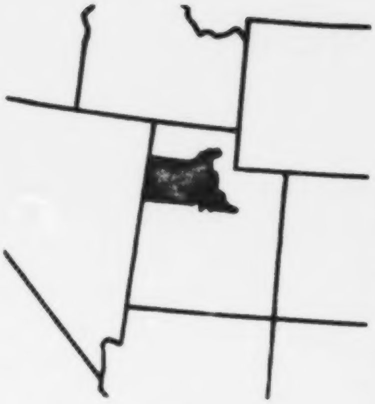


	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	2,124,000	996,208
STATE TOTAL	3,805,000	1,756,706
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATE	55.80	56.70
REGION'S % OF U.S.	1.04	1.15
STATES' % OF U.S.	1.87	2.03

INCLUDED COUNTIES

1 ANOKA
2 BENTON
3 CARVER
4 CHISAGO
5 DAKOTA
6 HENNEPIN
7 ISANTI
8 KANABEC
9 MILLE LACS
10 PINE
11 RAMSEY
12 SCOTT
13 SHERBOURNE
14 STEARNS
15 WASHINGTON
16 WRIGHT

Figure C-16. Car Registrations, Minneapolis/St. Paul, Minn. Region



INCLUDED COUNTIES

1 DAVIS
2 MORGAN
3 SALT LAKE
4 TOOELE
5 UTAH

	POPULATION	PASSENGER CARS REGISTERED
AIR QUALITY CONTROL REGION	722,000	316,307
STATE TOTAL	1,059,000	456,502
U.S. TOTAL	203,235,000	86,438,957
REGION'S % OF STATE	68	69.29
REGION'S % OF U.S.	0.355	0.37
STATE'S % OF U.S.	0.52	0.53

Figure C-17. Car Registrations, Salt Lake City, Utah Region

Table C-1. General Motors 1971 Registrations

AQCR	AQCR Reg's	G. M. Reg's	% AQCR	% G.M. Total	Cum % G.M. Total
California	875,777	234,520	26.78	5.34	5.34
Houston	113,422	48,698	42.94	1.11	6.45
Phoenix/Tucson	63,506	21,017	33.09	0.48	6.93
La/Texas	127,263	52,579	41.22	1.20	8.12
Boston	156,438	59,995	38.35	1.37	9.49
Philadelphia	150,576	61,694	40.97	1.40	10.80
Portland	71,623	18,222	25.44	0.41	11.31
Fairbanks	1,543	387	25.08	0.008	11.32
Baltimore	111,889	50,230	44.89	1.14	12.46
NY/NJ	771,315	319,373	41.41	7.27	19.73
Spokane	16,293	5,018	30.80	0.11	19.84
Denver	64,124	18,590	28.99	0.42	20.27
Washington, D.C.	157,587	57,050	36.20	1.30	21.57
Pittsburgh	126,419	47,715	37.74	1.09	22.65
Seattle	62,774	16,771	26.72	0.38	23.03
Minneapolis	98,045	39,882	40.68	0.91	23.94
Salt Lake City	28,025	8,549	30.50	0.19	24.14
	2,996,619	1,060,290	35.38	24.14	

Table C-2. Ford 1971 Registrations

AQCR	AQCR Reg's	Ford Reg's	% AQCR	% Ford Total	Cum % Ford Total
California	875,777	213,195	24.34	9.32	9.32
Houston	113,422	29,045	25.61	1.27	10.59
Phoenix/Tucson	63,506	16,356	25.76	0.71	11.30
La/Texas	127,263	33,558	26.31	1.47	12.77
Boston	156,438	37,737	24.12	1.65	14.42
Philadelphia	150,576	32,849	21.82	1.44	15.86
Portland	71,623	16,036	22.39	0.70	16.56
Fairbanks	1,543	362	23.46	0.015	16.58
Baltimore	111,889	33,383	29.84	1.46	18.04
NY/NJ	771,315	154,183	19.99	6.74	24.78
Spokane	16,293	3,707	22.75	0.16	24.94
Denver	64,124	16,704	25.07	0.70	25.64
Washington, D.C.	157,587	39,537	25.09	1.73	27.37
Pittsburgh	126,419	29,708	23.50	1.30	28.67
Seattle	62,774	15,760	25.11	0.69	29.36
Minneapolis	98,045	26,297	26.82	1.15	30.51
Salt Lake City	28,025	7,516	26.82	0.33	30.84
	2,996,619	705,933	23.56	30.84	

Table C-3. Chrysler 1971 Registrations

AQCR	AQCR Reg's	Chrys. Reg's	% AQCR	% Chrys. Total	Cum % Chrys. Total
California	875,777	99,446	11.36	7.46	7.46
Houston	113,422	15,246	13.44	1.14	8.60
Phoenix/Tucson	63,506	8,806	13.87	0.66	9.24
La/Texas	127,263	19,899	15.60	1.49	10.75
Boston	156,438	25,261	16.15	1.89	12.64
Philadelphia	150,576	23,010	15.28	1.73	14.37
Portland	71,623	8,868	12.38	0.66	15.03
Fairbanks	1,543	205	13.29	0.015	15.05
Baltimore	111,889	18,698	16.71	1.40	16.45
NY/NJ	771,315	134,156	17.39	10.06	26.51
Spokane	16,293	2,616	16.06	0.20	26.71
Denver	64,124	8,463	13.20	0.63	27.34
Washington, D.C.	157,587	25,088	15.92	1.88	29.22
Pittsburgh	126,419	17,274	13.66	1.30	30.52
Seattle	62.774	8,339	13.28	0.63	31.14
Minneapolis	98,045	16,808	17.14	1.26	32.40
Salt Lake City	28,025	4,043	14.43	0.30	32.70
	2,996,619	436,226	14.56	32.70	

Table C-4. American Motors 1971 Registrations

AQCR	AQCR Reg's	A.M. Reg's	% AQCR	% A.M. Total	Cum % A.M. Total
California	875,777	17,856	2.04	7.34	7.34
Houston	113,422	1,631	1.44	0.67	8.01
Phoenix/Tucson	63,506	2,005	3.16	0.82	8.84
La/Texas	127,263	1,486	1.16	0.61	9.45
Boston	156,438	1.906	1.22	0.78	10.23
Philadelphia	150,576	4,873	3.24	2.00	12.24
Portland	71,623	2,296	3.21	0.94	13.18
Fairbanks	1,543	72	4.67	0.029	13.21
Baltimore	111,889	2,979	2.66	1.23	14.44
NY/NJ	771,315	15,365	1.99	6.32	20.76
Spokane	16,293	539	3.31	0.22	20.98
Denver	64,124	1,832	2.86	0.75	21.73
Washington, D.C.	157,587	2,973	1.89	1.22	22.96
Pittsburgh	126,419	4,305	3.41	1.77	24.73
Seattle	62,774	1,266	2.02	0.52	25.25
Minneapolis	98,045	3,661	3.73	1.51	26.75
Salt Lake City	28,025	680	2.43	0.28	27.03
	2,996,619	65,725	2.19	27.03	

Table C-5. Volkswagen 1971 Registrations

AQCR	AQCR Reg's	VW Reg's	% AQCR	% VW Total	Cum % VW Total
California	875,777	87,328	9.97	17.15	17.15
Houston	113,442	5,914	5.21	1.16	18.31
Phoenix/Tucson	63,506	5,321	8,38	1.04	19.36
La/Texas	127,263	7,477	5,86	1.47	20.82
Boston	156,438	11,538	7.38	2.27	23.09
Philadelphia	150,576	12,858	8.54	2.53	25.62
Portland	71,623	6,156	8.60	1.21	26.82
Fairbanks	1,543	206	13.35	0.04	26.86
Baltimore	111,889	6,393	5.71	1.26	28.12
NY/NJ	771,315	57,800	7.49	11.35	39.47
Spokane	16,293	1,514	9.29	0.30	39.77
Denver	64,124	5,708	8.90	1.12	40.89
Washington, D.C.	157,587	10,380	6.59	2.04	42.93
Pittsburgh	126,419	14,242	11.27	2.80	45.73
Seattle	62,774	5,226	8.33	1.03	46.75
Minneapolis	98,045	4,394	4.48	0.86	47.61
Salt Lake City	28,025	2,442	8.71	0.48	48.09
	2,996,619	244,897	8.17	48.09	

Table C-6. Toyota 1971 Registrations

AQCR	AQCR Reg's	Toyota Reg's	% AQCR	% Toyota Total	Cum % Toyota Total
California	875,777	65,440	7.47	24.19	24.19
Houston	113,422	5,756	5.07	2.13	26.32
Phoenix/Tucson	63,506	3,457	5.44	1.28	27.60
La/Texas	127,263	5,669	4.44	2.10	29.69
Boston	156,438	7,680	4.91	2.84	32.53
Philadelphia	150,576	4,424	2.94	1.64	34.17
Portland	71,623	4,578	6.39	1.69	35.86
Fairbanks	1,543	128	8.30	0.047	35.91
Baltimore	111,889	2,322	2.08	0.86	36.77
NY/NJ	771,315	24,168	3.13	8.93	45.70
Spokane	16,293	674	4.14	0.25	45.95
Denver	64,124	3,438	5.36	1.27	47.22
Washington, D.C.	157,587	3,829	2.43	1.42	48.63
Pittsburgh	126,419	2,328	1.84	0.86	49.50
Seattle	62,774	3,866	6.19	1.44	50.92
Minneapolis	98,045	2,144	2.19	0.79	51.72
Salta Lake City	28,025	1,633	5.83	0.60	52.32
	2,996,619	141,534	4.72	52.32	

Table C-7. Datsun 1971 Registrations

AQCR	AQCR Reg's	Datsun Reg's	% AQCR	% Datsun Total	Cum % Datsun Total
California	875,777	55,202	6.30	30.32	30.32
Houston	113,422	1,436	1.27	0.79	31.11
Phoenix/Tucson	63,506	2,531	3.99	1.39	32.50
La/Texas	127,263	2,177	1.71	1.20	33.70
Boston	156,438	2,316	1.48	1.27	34.97
Philadelphia	150,576	1,661	1.10	0.91	35.88
Portland	71,623	4,658	6.50	2.56	38.44
Fairbanks	1,543	67	4.34	0.036	38.48
Baltimore	111,889	2,408	2.15	1.32	39.80
NY/NJ	771,315	9,232	0.60	5.07	44.87
Spokane	16,293	1,066	6.54	0.59	45.45
Denver	64,124	2,344	3.66	1.29	46.74
Washington, D.C.	157,587	3,307	2.10	1.82	48.56
Pittsburgh	126,419	1,620	1.28	0.89	49.45
Seattle	62,774	3,470	5.53	1.91	51.35
Minneapolis	98,045	657	0.67	0.36	51.72
Salt Lake City	28,025	890	3.18	0.49	52.20
	2,996,619	95,042	3.17	52.20	

APPENDIX D

A TWO-LEVEL APPROACH TO NATIONAL AUTOMOTIVE EMISSION CONTROL

General Motors, October 1972

Abstract

This paper outlines a proposal that the U.S. convert to a two-level approach for automotive emission control. One level would be a Type A system meeting 1973 emission control requirements built for most of the nation, and the other level a Type B system meeting more stringent control requirements for those areas with automotive-related air pollution problems. Ten-year cost savings to the nation of at least 14 to 22 billion dollars are estimated, depending on the severity of control for the cars equipped with the Type B system.

APPENDIX D

A TWO-LEVEL APPROACH TO NATIONAL AUTOMOTIVE EMISSION CONTROL

General Motors Statement

D. 1 Introduction

On February 28, 1972, the Ad Hoc Committee on the Cumulative Regulatory Effects on the Cost of Automotive Transportation (RECAT) published its report for the Office of Science and Technology. This report suggested "a low emission car for those regions where automotive emissions are a dominant air pollution problem or a major component of the problem and a lower cost higher emission vehicle for those parts of the country where air quality would not be essentially degraded by such less controlled vehicles." In addition to the economic benefits that would result from such a two-level approach, there are also substantial benefits to the nation and the entire world in the conservation of natural resources resulting from saving of fuel and certain limited availability metallic materials. Further, there is the probable improvement in driveability for vehicles with less severely controlled emissions. The intent of this paper is not to explore in minute detail all aspects of the two-level approach, but merely to indicate in a general way the pros and cons, point out the potential savings and indicate the desirability of pursuing such an approach.

D. 2 General Discussion

The RECAT report alludes to the possibility that the two-level approach might be expanded to a three- or even a four-level approach with graded levels of emission control. However, the Committee believes that the added complexity which would result from more than two levels of emission control would not be justified. In the first place, the present levels of emission control (1973 model cars) are already severe enough that interim steps in control between the present level and what might be termed the "ultimate level" would be relatively small. Secondly, the added cost to manufacture the additional types of emission control systems would tend to dilute the economic benefits. As a result, The Committee proposes that the U.S. convert to the two-level approach for automotive emission control; one fraction of the new car population would be built to present (1973) emission standards, hereinafter referred to as Type A cars, and the other fraction of the new cars would be equipped with controls adequate to satisfy those areas of the nation which have the most severe automotive air pollution problem. This Type B car would be the same as the Type A car except that it would be equipped to comply with the modified 1976 emission standards suggested by the Committee and discussed in detail in the preceding paper.

In order to make an intelligent assessment of the two-level concept, there are some additional details which need to be known and some decisions which need to be made. The federal government should prescribe the emission levels for Type A and Type B cars as well as the regulatory rules necessary to ensure proper compliance by automobile manufacturers. Different automotive emission regulations for each of the 50 states obviously would be unworkable. The organization and procedures for federal control are already well established by the U.S. Environmental Protection Agency. The selection of either Type A or Type B cars for a particular locale should be a decision made by the local government. This could result in the most efficient cost-benefit tradeoffs of automotive emission control versus control of emissions from stationary sources. From the standpoint of more practical politics, the decision-making responsibility would be reserved for authorities closest to the problem. However, the choice of locales which would be permitted to have the foregoing decision-making authority would be made by the federal government. Actually, these choices already have been made. They are the air quality control regions defined by the Environmental Protection Agency.

It seems axiomatic that a viable national two-level approach nationwide must provide for a substantial fraction of lower cost Type A cars in the total vehicle population. The RECAT report estimated a minimum of

30% of the total population did not require more stringent emission control than presently (then 1971 models) installed on new production vehicles. However, this estimate was based only on vehicle density data and RECAT suggested that more precise estimates could be made after completion of the state air quality standards implementation plans. GM engineers made such an estimate from data contained in and related to these state implementation plans. That estimate shows the two-level approach would include more than 50% of the Type A cars. The estimate was based on the assumption that any air quality control region which was shown by the state implementation plan to achieve the federal air quality standards in 1975 without control of automotove emissions beyond federal new car standards could be considered to require no more than the Type A car. The federal air quality standards would be achieved with the 1973 automotive emission standards as essentially the final level of automotive emission control, since 1975 cars would have only a very limited impact on emissions from the total 1975 car population. Actually, based on 1971 registrations of new General Motors automobiles, as much as 50% of the car population would satisfy the foregoing Type A criteria. Considering that the air quality standards recommended by GM are significantly less severe than the federal standards, the 50/50 split between Type A and Type B cars appears to be very conservative.

D. 3 Cost Savings Estimate

On the basis of a 50/50 split between Type A and Type B controls on automobiles, the potential investment and maintenance and operating cost savings to be realized from a two-car marketing program could be substantial. The selection of appropriate cost data naturally requires that certain assumptions be made with regard to the emission control systems required, future economics and inflation, the size of the new-car markets and General Motors participation in new car sales, population growth and movement trends, and possible future increased production and engineering efficiencies.

The emission control systems on the Type A cars would be the same as those used on 1973 models. Production emission control systems for

Type B vehicles are not as yet completely defined. However, the most promising system is one involving the use of catalytic converter for oxidation of the engine exhaust HC and CO. Exhaust gas recirculation (EGR) also is a feature of the overall system. A high-energy ignition system (HEI) will be incorporated to provide a much longer ignition system life and higher voltage capability both to enhance the long-term reliability of the overall emission control system and to permit the use of wider gap spark plugs resulting in more reliable ignition of the mixture in the combustion chamber.

To meet the EPA's 1976 requirements, the only experimental approach evaluated to date which shows promise is the addition of a reducing catalytic converter to the Type B car.

Estimates of the cost of Type A and Type B emission control systems (as well as "1976 EPA specification" hardware) have been taken from the report of the RECAT Committee which cites U.S. automobile manufacturers' responses to the Committee's questionnaire as their source. Additional data, such as new car registrations, new car survival rates, maintenance and operating cost estimates and a "learning curve" estimate for engineering and production efficiencies, were all taken from the RECAT report or the sources cited there and adjusted to reflect only the difference in cost between Type A, Type B and "1976 EPA" systems. (The RECAT figures are for advanced control systems versus a pre-1968, uncontrolled system.) No estimate was made for cost increases due to future economics or inflation. Therefore, the figures in Table D-1 represent a very conservative estimate of the potential savings to the consumer and resultant preservation of national resources from allowing Type A cars to be sold in selected areas after the 1975 model year.

The potential investment savings (first cost to the consumer) by permitting both Type A and Type B cars to be sold is estimated to begin at $164 per car and decreases to $112 per car at the end of ten years. Thus, the "learning curve" for the automobile manufacturer is assumed to reduce the consumer cost of the Type B car by $52 during the first decade of production. A similar determination of maintenance and operating costs indicates annual savings of $17 per car, decreasing to $12 per car after the first ten years.

It was assumed that annual operating and maintenance savings per Type A vehicle manufactured after the 1975 model year remains the same for the respective model years throughout the vehicle life. Vehicle life is based on the RECAT survival rate table.

As shown in Table D-1, the estimated aggregate economic savings of the two-level program from using 50 percent Type A versus 100 percent Type B vehicles during the 1976-1985 period would be \$7.0 billion for General Motors' customers alone. This represents an investment savings component of \$4.5 billion and operating and maintenance component of \$2.5 billion. On an annual basis, the saving is \$0.7 billion. After the initial "conversion decade" (approximate time required to replace the U.S. car population), the annual savings would be \$0.9 billion. It should be emphasized that these savings could be realized by the nation's consumers and at the same time maintain the required air quality. An average car would sell for about \$100 less in 1976 -- provided the investment savings is spread over all cars sold to avoid a two-price system and about \$200 less if the savings are passed on to Type A car buyers only.

Table D-2 presents the estimated aggregate economic savings of a two-level program using 50 percent Type A versus 100 percent 1976 EPA-specification vehicles during the 1976-1985 period. The aggregate savings of \$11.2 billion includes \$7.3 billion of investment and \$3.9 billion in maintenance and operating cost, or \$1.1 billion annually. After the conversion decade, the annual savings would be \$1.4 billion with equal investment and maintenance and operating components.

The calculations presented in Tables D-1 and D-2 can be extended to encompass the entire U.S. automotive market. This would result in a savings more than double the savings estimated for General Motors customers alone -- more than \$14 billion for a decade of 50 percent Type A versus 100 percent Type B cars.

Certainly these results indicate that serious consideration should be given by the federal government to the adoptionof a two-level approach for controlling automotive emissions.

D. 4 Administrative and Regulatory Problems

The investigation of the economic merit of the two-level approach raises certain administrative and regulatory questions. Obviously, if the Type A and Type B cars are segregated on a statewide basis, the regulatory procedures are minimized. However, in this analysis, the federal air quality control regions were used as the defined locales, and the boundaries of those regions are defined by counties. In a few instances, they are even interstate. Consequently, the control regulations do suggest some complications. The implementation of the following procedure would minimize the administrative control segment of the two-level approach to automotive emission control.

The Type A and Type B cars would be identified through the vehicle serial number. Considering the complexity of the system and the body and engine modifications required to convert a Type A vehicle into a Type B vehicle, it is expected to be difficult and economically impractical to modify the emission control equipment in the after-market. Thus, the relative emission level of a car could be identified. New registration regulations probably would prohibit the registration of a motor vehicle outside the county of the owner's legal residence. The burden of proof would be the responsibility of the automobile owner at the time of registration. This procedure is currently practiced in some states that have additional registration cost for uninsured motorists and practically no financial burdens have been incurred from an administrative standpoint. With little effort counties could effectively control the registration of cars.

If a vehicle owner moved his residence from a Type A area to a Type B area, one alternative would be to sell his vehicle and procure one that met the requirements of the area. In response to the argument that this is unfair treatment, one must consider that similar relocating disadvantages already exist. For example, relocating to a city or state that has higher sales tax or income tax rates. It would be simply part of the advantages or disadvantages of relocating. Another alternative would be for the Type B areas to place a punitive tax on the less controlled Type A vehicles to discourage their ownership in Type B areas.

Another method of prohibiting the use of Type A vehicles in Type B areas would be to have county-mandated vehicle inspection regulations. One could not receive a vehicle inspection sticker unless the vehicle was equipped with the proper emission control equipment. Obviously, the car would require inspection in the county of the owner's legal residence.

A potential weakness of the two-level approach results from the mobility of the American public. Car owners from regions which license the Type A cars will need to have access to Type B areas. To deny this freedom of mobility would surely impose cumbersome, disruptive and expensive penalties; however, it should be noted that as currently considered, the Type A cars would still have the 1973 level of emissions control equipment which represents a reduction from the uncontrolled 1960 level of 80 percent of hydrocarbons, 69 percent of carbon monoxide and 38 percent of oxides of nitrogen. So, even the Type A car would be a pretty "clean" car.

In addition, the counties surrounding metropolitan areas are included in the air quality control regions as if all of them had unacceptable air quality. This helps to keep the number of Type A cars moving into these sections to a tolerable minimum, both visiting cars and through traffic.

D.5 Manufacturers' Problems -- Marketing and Production

The marketing and production implications of a two-level approach are not considerably different from those in the current U.S. automotive market as a result of the difference between federal and California standards. However, there are some potential problems.

The major marketing consideration is the pricing problem. A two-level price reflecting the cost of additional equipment on Type B vehicles would create regulatory burden by encouraging such buyers to acquire and illegally operate Type A vehicles. If all manufacturers were required to spread the gross savings over all vehicles, the two-tier pricing problem would be eliminated. However, this would destroy the local incentive to allow

Type A cars regardless of existing or anticipated air quality. Marketing experience in California strongly suggests that the additional Type B hardware and associated costs could best be handled at the retail level as a "mandatory option." Proper enforcement of the registration or inspection regulations previously described could hold "cheating" to a negligible level.

In general, any change in vehicle design or marketing philosophy which adds proliferation potential to the product line, affects production organizations adversely. A two-level approach to emission control would thus be expected to add problems and cost to areas of production operations such as material inventory, scheduling, handling, and obsolescence as well as operator training, quality control and manpower productivity. The degree to which assembly operations would be affected would depend on precise definitions of emission control hardware and vehicle order and distribution requirements.

D. 6 Conclusion

Certainly the implementation of a two-level approach to automotive emissions control could not be accomplished without some additional burdens on the manufacturer and governmental agencies. However, it appears that the potential benefits to the nation outweigh those disadvantages to such an extent that immediate serious detailed study by involved governmental agencies is indicated.

Table D-1. Estimate of Aggregate Economic Savings of a Two-Car Marketing Program Type A and Type B Vehicles (General Motors Cars Only)

Time Interval	Savings (Billions of Dollars)			
	Investment	Maintenance and Operation	Total	Annualized Total
"Conversion Decade" (1976 - 1985)	4.5	2.5	7.0	0.7
Annual, First Year After "Conversion Decade"	0.5	0.4	0.9	0.9

Table D-2. Estimate of Aggregate Economic Savings of a Two-Car Marketing Program Type A and 1976 EPA-Specification Vehicles (General Motors Cars Only)

Time Interval	Savings (Billions of Dollars)			
	Investment	Maintenance and Operation	Total	Annualized Total
"Conversion Decade" (1976 - 1985)	7.3	3.9	11.2	1.1
Annual, First Year After "Conversion Decade"	0.7	0.7	1.4	1.4

APPENDIX E

GENERAL MOTORS STATEMENT - TWO-CAR STRATEGY

During the General Motors appearance at the 1975 emission suspension hearing on March 12, 1973, EPA suggested that General Motors consider the possibility of marketing cars with catalytic converters in the fifteen most highly stressed air quality regions in the country rather than only in the State of California as proposed by General Motors. The fifteen air quality regions involved are assumed to be those identified by EPA.

An initial analysis of the EPA proposal has been made and is presented herein. The analysis considers the risk to the public resulting from manufacturing, marketing, logistics and enforcement problems as well as the risks to General Motors, to the extent they can be evaluated in the limited time available. The potential improvements in air quality have not been developed, but they are estimated to be minor.

E. 1 Conclusion

Extending the limited production of 1975 vehicles with advanced emission control systems to other areas than California, while having theoretical merit, would, in addition to increasing manufacturing and distribution problems, involve a complex and difficult enforcement system. We would need, roughly, to double the 7% of production figure to cover the 15 most highly stressed areas. This would bring about additional complexity of distribution of the vehicles and training of personnel. We do not know how residents of the stressed areas could be prevented from buying cars in other areas.

E. 2 Background

As an experienced manufacturer of mass-produced products, General Motors normally schedules a phased or gradual introduction of newly developed and little-tested equipment. This is especially critical in the case of sophisticated emission controls. We require production experience and actual knowledge of a product's performance in the field before committing massive resources to across-the-board manufacture where the risks are greatly and unreasonably multiplied.

To gain such experience, GM proposed that the EPA and the State of California permit installation of catalytic converters and other special control equipment in 1975 model cars sold in California. On these California cars, the ceritification levels would be 0.76 grams per mile HC, 5.7 grams per mile CO, and 3.1 grams per mile NOx (on the premise that EPA adopts the suggested changes with respect to averaging, end-of-line testing, and warranty and recall regulations).

The choice of California for GM's proposed phased introduction was based on these criteria:

a. California contains areas of the greatest stress in automotive air pollution, and a wide variety of climatic and road conditions.

b. More than 7% of our nationwide production is sold in California; an amount exceeded in only two other states.

c. Choosing a single geographic area rather than a single model line for a phased introduction provides across-the-board experience with several types and sizes of cars.

d. An initial service parts distribution can be made in one area.

e. Field service training can be conducted in one area and thoroughly evaluated before being conducted nationwide.

f. In the event a recall or modification is necessary, all of the vehicles would be in one general area.

The General Motors proposal of introducing catalytic converter equipped vehicles in California has been based on motor vehicles from all car divisions (Chevrolet, Pontiac, Oldsmobile, Buick, Cadillac), but certain models may not be available.

E.3 EPA Proposal

At the EPA Suspension Hearing on 3-12-73, Mr. Sansom, Assistant Administrator for Air and Water Programs, asked if GM would consider a "major cities" distribution of catalytic converter cars to satisfy the demands of high stressed air quality regions rather than just the single area of California. He recognized a higher percentage of production would be involved (suggested 15%) and that strict regulation and enforcement would be necessary in order to assure the sale and use of these vehicles. Implied was the need for nationwide availability of catalytic converter fuel (low lead) for either proposal to permit normal customer use.

The major problem with this proposal is one of regulation to assure that vehicles with special emission control equipment are purchased and used in the intended localities. An effective vehicle registration, licensing, and inspection plan would have to be developed by the EPA, state and local regulatory agencies.

E.4 Proposal Evaluation

E.4.1 Hardware

While current plans provide for 100% capacity, installing a single converter assembly line initially permits evaluation and debugging prior to full production. First year production capability from a single converter assembly line is estimated at approximately 12%. Assuming on-time installation of all components of the manufacturing facility and development of the processing technology, the production parts and service parts would be built on an accelerating rate through the model year. Experience gained would permit subsequent installation of additional manufacturing lines aimed at providing nationwide capability during the following year.

E.4.2 Car Assembly

GM currently has 21 plants assembling passenger cars and light trucks and three plants assembling light trucks. Thirteen of these plants build or have built California models in addition to Federal models. The complexity of two distinct, separate engine and power trains in otherwise identical models has already been comprehended in these plants. The EPA major cities plan would require converting some additional plants to being "two-system" plants or would require cross shipping of cars, which would add to the expense imposed upon the public.

E.4.3 Car Distribution

GM is, of course, experienced in car distribution (the right car in the right place at the right time) and while it would be very difficult for us to provide a full model mix for various cities in the country, it would not be an impossible task. Shipping two kinds of cars to a single major metropolitan area for subsequent reshipment to outlying areas will impose logistics problems. For example, a metropolitan dealer serving rural and urban areas would require a very large inventory to adequately cover both kinds of vehicles for both markets he serves.

E.4.4 Sales Consideration

A dealer will have many problems to cope with in a "controlled city":

a. A potential customer may give his vacation home address or use that of a family member to avoid buying a converter car.

b. Where does the control district stop? The customer may claim he lives just outside the district.

c. If an owner has purchased a new 1975 car under false pretenses, is the dealer obligated to buy it back or retrofit the car with a converter?

These few are only suggestive of the large number of questions that can be developed. A major training program will be necessary to properly inform the sales people of the advantages of catalytic converter cars.

E.4.5 Service

Service complexity will be considerably greater than in the original California proposal. Limiting 1975 introduction to California permitted concentration in one area. Distribution in several major cities requires:

a. Complete availability of service parts on practically a nationwide basis with the introduction of the 1975 models.

b. Special service equipment available in all dealerships, rather than just Southwest U.S. to start.

c. A nationwide, Service Technician Training Program.

E.4.6 Enforcement

The historical position of California since 1966 is important. Cars with special emission equipment have been sold in the state at extra cost to the customer for several years. The inspection and licensing procedures are well established at the state level and California residents have generally been receptive to emission controls. As we have previously mentioned, mandatory installation of special emission equipment on a regional or city basis will require elaborate licensing and inspection procedures. Enforcement at less than the state level appears almost impossible.

Consider the problems of manufacturing, distribution, service and enforcement, the original General Motors proposal to introduce catalytic converters in the State of California for 1975 prior to going nationwide in 1976, is the most feasible for General Motors.

APPENDIX F

SUPPLEMENTAL COMMENTS ON SELECTED INTRODUCTION OF CATALYSTS IN MULTIPLE AIR QUALITY REGIONS

Ford Statement

During Ford's appearance at these hearings on March 13, 1973, questions were asked regarding the possibility of equipping passenger cars with catalysts for use in 15 selected cities or regions across the country. We have stated for the record Ford's view that the Administrator lacks the requisite legal authority to compel such a result. This supplement to our testimony addresses other aspects of Ford's position in opposition to such an approach for 1975.

At the outset, we should express our view that a strategy limiting the requirement for catalyst-equipped vehicles to California only is feasible, practical and desirable. In fact, such a system has a historical background incorporated as far back as 1961 on crankcase ventilation systems and later in 1966 on exhaust emission systems controlling HC and CO, in 1970 on Evaporative Emission Controls and as recently as 1972 models embodying NO_x controls. The California public, enforcement activities, legislature, car dealers, mechanics, and the manufacturers' sales, service and manufacturing groups have had almost twelve years of experience in working with such a system.

Expansion of this approach which would require catalyst-equipped vehicles for a multiplicity of cities and regions is in our opinion incalculably complex and difficult to administer. When one considers that the extremely intricate enforcement would have to be set up by law in various states for only a one-year period, its limitations become obvious.

It is disruptive of acceptable channels of distribution, sales and enforcement for the consumer, government (Federal, State, County and City) as well as the manufacturer -- without concomitant benefits. To make such a system operable involves sizable allocation of enforcement manpower, passing of appropriate state and local enforcement laws involving the sale, use and registering of motor vehicles, appropriation of money to put into effect enforcement machinery not now available, and the changing of mass production oriented facilities to selective options on geographical basis for only a one-year period.

The problems can be categorized into the following broad groupings: (1) Title and registration; (2) Enforcement; (3) Merchandising - Service; and (4) Manufacturing and distribution.

F.1 Title and Registration

To be effective as a controlled test, all new vehicles to be sold in a city or geographic area must be equipped with the catalyst system. At this time no state to our knowledge, has the legal and enforcement machinery to control the registration of a specific equipped vehicle in a geographic area less than an entire state. If the selected area is not identical with state boundaries, the problem becomes immeasurably more complex.

For each such area, state vehicle registration requirements must require residents to register only the appropriately equipped new vehicles. Title and registration procedures on all new passenger car vehicles to be effective for a given city or area must, at a minimum, have state laws passed which make it illegal and provide appropriate penalties for:

a. A resident of a community to purchase a vehicle not equipped. (Must be flexible to handle hardship cases such as accidents outside the area, even state, etc., and provide means for enforcement.)

b. A resident to falsify his residency so he can purchase a non-equipped vehicle.

c. Anyone in the state not to tamper, alter or make inoperable an equipped vehicle.

d. A resident from operating a vehicle knowing that the emission system has been altered or made inoperable.

e. A person selling or offering for a sale a new or used vehicle not in compliance with the law.

At the present and for the foreseeable near future (certainly by September 1974), only California has or will have the experience necessary to deal effectively with the problems associated with such requirements.

F.2 Enforcement

This area relates specifically to insuring that the residents do, in fact, buy and use new motor vehicles equipped with catalyst systems. A requirement without enforcement is meaningless. Consequently, the enforcement authorities must ensure that a catalytic converter has in fact been installed. A periodic vehicle inspection procedure is almost mandatory. Random inspection coupled with changes of ownership inspection requirements is effective to a lesser degree.

With a new and complex system it is obvious that previous enforcement experience will mitigate problems. It is also likely that the public enforcement relationship which had developed over a long period of time will also tend to reduce problems in this area to a minimum. California has this experience and the organization. No other state could really do this in the time remaining between now and introduction of 1975 models in 18 months. The fact that the proposal would operate only one year under present law would make this seem impractical even if it could be accomplished in the time remaining.

F.3 Merchandising and Service

The problems associated with this area are also difficult to resolve on anything but a state-wide basis. In certain areas, even state boundaries would not adequately define the sales and service area. For example, dealerships are located on a sales area basis as opposed to specific air quality regions. The same is true of company district and regional sales offices. Their total sales are not confined to their respective air quality region. Sales are made not only from dealer to customer but from dealer to dealer. Many dealers would have to cope with the problems attendant upon storing, selling and servicing two distinct types of systems on each of their models. In stocking their inventories, dealers would be forced to estimate the percentage of their sales to customers within and outside the specially regulated area. The result in many cases could be vehicle inventories which are out of line with customer demand. In any event, if the dealers have the responsibility for not selling unequipped vehicles to residents of the selected areas then they cannot fairly be held accountable for the truthfulness of the customer relative to residency. Even with California standards on a statewide basis, California and contiguous state dealers have experienced these problems over a considerable period of time.

Since the catalyst system involves engineering technology not heretofore employed, considerable technical instruction and development of repair techniques are required. By concentrating instructional talent and facilities in one state, coverage can be made more complete and more effective thereby increasing the likelihood that the systems are serviced properly and promptly by the largest and most proficient service group possible. It is also clear that with one concentrated area to deal with, faster customer response can be achieved. The resolution of service difficulties and the provision of parts can be expedited if only a single area is involved.

F.4 Manufacturing and Distribution

By virtue of the intended selection of cities and areas throughout the country, many of our assembly plants would be affected. These plants must provide for assembling, storing and handling highly sophisticated equipment such as the catalysts, unique engines and other devices for use in the selected areas. At the same time, they must handle the mass assembly of units using standard equipment. Under the California approach some of our plants have had to supply one unique requirement area. To add a multiplicity of additional areas would involve more of our plants with considerably more complexity. The extent of this complexity would vary with eachplant and its car line mix.

In summary, the introduction of catalysts in several select areas is not in our opinion feasible or practicable from the standpoint of the legislative, regulatory, enforcement and service needs. The situation is further compounded by those problems associated with the assembly and distribution of motor vehicles. It is our opinion that the time element is too short for effective implementation by both local governments, manufacturers and dealers. The best limited manufacture approach is to provide for catalyst in vehicles in California only in model year 1975.

APPENDIX G

STATE OR REGIONAL CONSIDERATIONS

This appendix is an overview of Section 5 of the main body of the report. It is presented here in briefing chart format to enable the reader to quickly grasp the essential ideas and facts without having to read Section 5 in detail.

TWO-CAR STRATEGY ISSUES

STATE OR REGIONAL CONSIDERATIONS

- REACTIONS TO TWO-CAR STRATEGY
- BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL
  - VEHICLE REGISTRATION CONTROL
  - CAR INSPECTION PROGRAMS
  - RETROFIT PROGRAMS
- REGION-PECULIAR FACTORS

CALIFORNIA

REACTIONS TO TWO - CAR STRATEGY

- NEW CALIFORNIA LAWS WOULD BE NEEDED TO RESPOND TO FEDERAL PROGRAM FOR TWO CAR STRATEGY - PRESENT LEGAL PROCEDURE FOR IMPLEMENTING AUTOMOBILE EMISSION CONTROL PROGRAMS INVOLVES REVIEW BY CALIFORNIA AIR RESOURCES BOARD (CARB), FOLLOWED BY AUTHORIZATION TO DEPARTMENT OF MOTOR VEHICLES (DMV) FOR SURVEILLANCE AND ENFORCEMENT
- IF PRICE DIFFERENTIAL BETWEEN TWO CLASSES OF CARS WERE SIGNIFICANT, PROBLEM WOULD BE CREATED BY RESIDENTS BUYING LESS STRINGENTLY CONTROLLED CARS IN NEVADA OR ARIZONA - CURRENT CALIFORNIA LAW ON NEW CAR EMISSION STANDARDS PERTAINS ONLY TO CARS FIRST SOLD AND REGISTERED IN STATE
- ASSUMING THE USE OF CATALYST SYSTEMS FOR 1975, AN ADEQUATE SUPPLY OF BOTH LEADED AND NON-LEADED GASOLINE WOULD BE REQUIRED FOR THE POPULATION OF NEW, USED AND NON-RESIDENT CARS. OUT-OF-STATE SUPPLY OF NON-LEADED GAS WOULD ALSO BE REQUIRED FOR TRIPS OUTSIDE OF STATE BOUNDARIES
- GEOGRAPHY OF STATE BORDERS WOULD MAKE THE PROBLEM OF CONTROL SIMPLIER THAN IN OTHER REGIONS

CALIFORNIA

REACTIONS TO TWO - CAR STRATEGY (Cont'd)

- A ONE-YEAR STATEWIDE PROGRAM MIGHT BE ACCEPTABLE IF EPA MANDATES A SUPPLY OF NON-LEADED GASOLINE THROUGHOUT COUNTRY
- CALIFORNIA DOES NOT WANT TO BECOME A "GUINEA PIG" FOR THE DEVELOPMENT OF THE CATALYTIC CONVERTER - CONCERN IS THAT A PROGRAM OF INDEFINITE DURATION WOULD LEAD TO THE EVOLUTION OF TWO PERMANENTLY DIFFERENT CONTROL SYSTEMS IN THE U.S.
- REGIONAL CONTROL WITHIN CALIFORNIA (for example, the South Coast plus San Diego air basins) MIGHT BE ENFORCEABLE. HOWEVER, STATE LAWS CONCERNING THE IDENTIFICATION OF RESIDENCY ON REGISTRATION WOULD HAVE TO BE CHANGED
- PROBLEM OF REGIONAL CONTROL WITHIN CALIFORNIA WOULD BE CONVINCING LEGISLATORS TO ACCEPT CONTROL OR NON-CONTROL IN THEIR RESPECTIVE JURISDICTIONS
- CALIFORNIA IS PRESENTLY OPERATING A REGIONAL STRATEGY WITH RESPECT TO RETROFIT EMISSION CONTROL SYSTEMS FOR 1955 - 1965 MODEL YEAR CARS

CALIFORNIA

BAKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

VEHICLE REGISTRATION CONTROL

- ANNUAL REGISTRATION MANDATORY - REREGISTRATIONS IMPLEMENTED BY MAIL FROM SACRAMENTO DMV - REGISTRATION DEADLINE FEBRUARY 15
- CERTIFICATION OF COMPLIANCE WITH EMISSION LAWS REQUIRED AS A CONDITION OF REGISTRATION FOR VEHICLES REGISTERING FROM OUT-OF-STATE AND FOR REREGISTERING USED VEHICLES ON TRANSFER OF OWNERSHIP - NEW CARS ARE CERTIFIED BY DEALERS TO BE EQUIPPED WITH CALIFORNIA-TYPE EMISSION CONTROLS
- REGISTRATION IS BASED ON COUNTY OF RESIDENCE, PRIMARILY FOR THE PURPOSE OF DISBURSING LICENSE FEE AND GAS TAX REVENUES TO LOCAL JURISDICTIONS - REGISTRANT CERTIFIES BY SIGNATURE THAT HE HAS RESIDED IN SPECIFIED COUNTY
- NO PROOF OF ADDRESS IS REQUIRED - BUSINESS OR RESIDENCE ADDRESS MAY BE GIVEN - NOT ILLEGAL TO GIVE ADDRESS DIFFERENT FROM LOCATION CAR IS DOMICILED
- OUT-OF-STATE VEHICLES REQUIRED TO REGISTER IN STATE WHEN CURRENT REGISTRATION LEGALLY EXPIRES, BUT NOT LONGER THAN ONE YEAR DURATION

CALIFORNIA

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

SAFETY INSPECTION PROGRAM

- SCHEDULED SAFETY INSPECTION IS NOT AN ESTABLISHED REQUIREMENT FOR CALIFORNIA CARS
- CURRENT PVI (Passenger Vehicle Inspection) PROGRAM CONSISTS OF RANDOM INSPECTION BY HIGHWAY PATROL TEAMS. 71 FIVE MAN TEAMS LOCATED THROUGHOUT THE STATE. EACH TEAM PROCESSES ABOUT 150 CARS/DAY
- INSPECTION TAKES 3 TO 5 MINUTES. LIGHTS, WIPERS, TIRES AND OTHER SAFETY EQUIPMENT CHECKED. GROSS SURVEY OF SMOG DEVICES IS ALSO MADE
- CITATIONS REQUIRED TO BE CORRECTED WITHIN 14 DAYS AT STATE - APPROVED "CLASS A" STATION IF HEADLIGHT AIMING, BRAKES, OR SMOG DEVICES ARE INVOLVED - ADJUSTMENTS MUST BE VERIFIED AT HIGHWAY PATROL OFFICES
- ENFORCEMENT IS TIED TO COLOR CODED WINDSHIELD INSPECTION STICKER
- PROGRAM CHECKS 12 TO 15 PERCENT OF CAR POPULATION YEARLY

CALIFORNIA

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

EMISSION INSPECTION PROGRAM

- SCHEDULED EMISSION INSPECTION IS NOT A REQUIREMENT FOR CALIFORNIA CARS
- ALL NEW CALIFORNIA CARS ARE ASSEMBLY-LINE TESTED FOR EMISSIONS: 75% IDLE, 25% ONE HOT 7 MODE CYCLE. IN ADDITION 2% QUALITY AUDIT WITH COLD START CVS CYCLE
- ASSEMBLY LINE TESTING PROGRAM IS DESIGNED TO DETECT AND ELIMINATE HIGH EMITTERS - THOSE EXCEEDING TWO STANDARD DEVIATIONS OF 100-CAR CONTROL SAMPLE DISTRIBUTION
- NEW CAR REGISTRATION REQUIRES DEALER CERTIFICATION THAT VEHICLE IS EQUIPPED WITH CALIFORNIA CONTROLS - PENALTY FOR ATTEMPTING TO SELL INVALID VEHICLE IS $5000
- ON-THE-ROAD CARS ARE BEING CHECKED IN PILOT INSPECTION PROGRAM TIED TO PVI SAFETY CHECK - 8 EXHAUST ANALYZERS IN OPERATION STATEWIDE
- ROAD CHECK REJECTION RATE IS ABOUT 25% - REPAIRS/ADJUSTMENTS ARE REQUIRED TO BE MADE AT STATE-APPROVED CLASS A STATIONS WITHIN 14 DAYS
- EMISSION CONTROL EQUIPMENT IS ALSO CHECKED ON REGISTERING VEHICLE FROM OUT OF STATE AND IN TRANSFERRING OWNERSHIP OF 1955 - 1965 MY CARS IN CERTAIN COUNTIES - OUT-OF-STATE INSPECTION IS TIED TO FEDERAL EMISSION REQUIREMENTS - TRANSFER OF OWNERSHIP INSPECTION RELATES TO CALIFORNIA HC/CO RETROFIT PROGRAM

CALIFORNIA

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

RETROFIT PROGRAM

- TWO RETROFIT PROGRAMS ARE IN FORCE - ONE FOR 1955-1965 MY CARS, ONE FOR 1966-1970 MY CARS
- 1955 - 1965 PROGRAM IN OPERATION SINCE SEPTEMBER, 1972 - COVERS CARS IN GEOGRAPHICAL REGION BASICALLY WITHIN SOUTH COAST AIR BASIN, SAN DIEGO COUNTY, SAN FRANCISCO BAY AREA
- TWO DEVICES HAVE BEEN CERTIFIED BY THE CARB - THESE ARE ESSENTIALLY SPARK RETARD MECHANISMS
- IMPLEMENTATION OF 1955-1965 RETROFIT PROGRAM OCCURS THROUGH TRANSFER OF VEHICLE OWNERSHIP - CERTIFICATE OF COMPLIANCE ISSUED BY STATE-APPROVED GARAGE, SIGNIFYING THAT VEHICLE HAS BEEN EQUIPPED, IS A PREREQUISITE FOR REGISTERING VEHICLE DOMICILED IN CONTROL REGION
- DMV IS NOT EQUIPPED OR EMPOWERED TO VERIFY ADDRESS OF APPLICANT
- 1966 - 1970 PROGRAM COMMENCED FEBRUARY, 1973 - FOUR DEVICES HAVE RECEIVED CERTIFICATION BY CARB - PROGRAM HAS STATEWIDE COVERAGE - TO BE INTRODUCED SEQUENTIALLY BY COUNTY - FINAL ENFORCEMENT WILL BE INSTALLATION AS PREREQUISITE FOR REGISTRATION IN 1975
- FOR BOTH DEVICES, RETROFIT OF VEHICLES FROM OUT OF STATE WILL BE REQUIRED FOR REGISTRATION

CALIFORNIA

REGION-PECULIAR FACTORS

- 1972 AUTOMOBILE REGISTRATION TOTALLED 9.1 MILLION
- 25 PERCENT OF AUTOMOBILE POPULATION CHANGES OWNERSHIP EACH YEAR
- 227,000 NON-RESIDENT VEHICLES REGISTER ANNUALLY (2.5 PERCENT)
- CALIFORNIA BORDER SITUATION WOULD MINIMIZE THE DEGRADATION OF AIR QUALITY DUE TO CIRCULATION OF LESS-STRINGENTLY-CONTROLLED VEHICLES
- CALIFORNIA EMISSION STANDARDS LOWER THAN FEDERAL STANDARDS - CALIFORNIA ONLY TWO-CAR STRATEGY EXISTS NOW. HOWEVER DIFFERENCE BETWEEN CARS IS SMALL
- WITH REGARD TO THE POSSIBILITY THAT RETROFIT MIGHT BE REQUIRED AS A DETERRENT TO THE PURCHASE OF NEW CARS OUT-OF-STATE, CALIFORNIA EXPERIENCE WITH CURRENT RETROFIT PROGRAMS INDICATES THAT A MINIMUM OF 15 MONTHS WOULD BE NEEDED FROM PASSAGE OF LEGISLATION TO FIRST INSTALLATION. PROCESS INVOLVES TESTING AND APPROVAL BY CARB, MANUFACTURE AND DISTRIBUTION

ALASKA

REACTIONS TO TWO-CAR STRATEGY

- 1975 EMISSION STANDARDS WILL HAVE LITTLE EFFECT ON AIR QUALITY IMPLEMENTATION PLAN
- FAIRBANKS HAS ICE FOG AND CO PROBLEM IN WINTER - LOWERING CO WILL NOT HELP ICE FOG PROBLEM WHICH IS CAUSED BY WATER IN EXHAUST
- TWO-CAR STRATEGY WON'T WORK IN ALASKA
- FAIRBANKS IS NOT RICH COMMUNITY - ADVERSE REACTION EXPECTED IF THEY ARE SINGLED OUT FOR MORE EXPENSIVE EMISSION CONTROLS
- SERIOUS DOUBTS ABOUT EFFECTIVENESS OF CATALYSTS IN COLD WEATHER AND UNDER ENGINE IDLING CONDITIONS

ALASKA

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

- VEHICLE REGISTRATION CONTROL
  - REGISTRATION HAS CITY AND ZIP CODE IDENTIFICATION
- INSPECTION PROGRAMS
  - NO VEHICLE SAFETY PROGRAM
  - NO MANDATORY EMISSION INSPECTION PROGRAM
  - VISIBLE EMISSIONS ONLY PROHIBITED - ENFORCED BY LOCAL POLICE
- RETROFIT PROGRAMS
  - NO RETROFIT PROGRAMS

ALASKA

REGION-PECULIAR FACTORS

- FAIRBANKS IS IN NATURAL BOWL - LONG, STABLE ICE FOG OCCURS IN WINTER WHEN TEMPERATURE IS BELOW -30°F
- ICE FOG PROBLEM CAUSED BY WATER IN EXHAUST. LOW CO WILL NOT HELP
- EMISSION CONTROL SYSTEMS DO NOT FUNCTION WELL IN EXTREME COLD WEATHER - PEOPLE TAMPER WITH OR TAKE OUT CONTROL SYSTEMS - NO ENFORCEMENT
- EXTREMELY COLD WEATHER - PEOPLE START CAR ENGINES WELL BEFORE TRAVELLING AND KEEP IT RUNNING ALL DAY - CONSIDERABLE IDLE EMISSIONS
- COLD WEATHER OPERATION OF ENGINES IS PROBLEM IN ITSELF
- PRICES ARE HIGHER IN FAIRBANKS THAN ANCHORAGE OR JUNEAU. ADDITIONAL PRICE DIFFERENTIAL OF LOW EMISSION CAR FOR FAIRBANKS (if a control region) WOULD CREATE MANY PROBLEMS OF ECONOMIC HARDSHIP OR LEAD TO CIRCUMVENTION OF CONTROL

ARIZONA

REACTIONS TO TWO CAR STRATEGY

- OVER 6 MILLION OUT-OF-STATE CARS ENTER ARIZONA EACH YEAR (about 7 times state vehicle registration) - ACCORDINGLY, CONTROL OF OUT-OF STATE CARS IS NOT FEASIBLE
- OXIDANTS AND 8 HOUR CO REQUIREMENT ARE MAJOR PROBLEMS IN PHOENIX/TUCSON AIR BASIN-VMT BY LESS STRINGENTLY CONTROLLED OUT-OF-STATE CARS WOULD DELAY ACHIEVEMENT OF ARIZONA AIR QUALITY GOALS
- FAVOR STATEWIDE RATHER THAN REGIONAL OR AIR BASIN CONTROL ZONES BOTH FROM POLITICAL AND ENFORCEMENT POINT OF VIEW

ARIZONA

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

VEHICLE REGISTRATION CONTROL

- YEARLY REGISTRATION IS MANDATORY
- ARIZONA IS IN PROCESS OF CONVERTING TO STAGGERED, MONTHLY REGISTRATION SYSTEM
- REGISTRATION IDENTIFIED BY COUNTY
- COMPLIANCE WITH PROPOSED EMISSIONS INSPECTION PROGRAM WOULD BE REQUIRED AS CONDITION FOR REGISTRATION IF AND WHEN PROGRAM IS IMPLEMENTED
- AT PRESENT, AFFIDAVIT OF EMISSION CONTROL COMPLIANCE (without inspection) ACCEPTED FOR REGISTRATION OF USED CARS - MANUFACTURER'S CERTIFICATION OF COMPLIANCE WITH FEDERAL STANDARDS ACCEPTED FOR REGISTRATION OF NEW CARS
- RECIPROCITY AGREEMENTS PERMIT VEHICLES DOMICILED WITHIN 25 MILE CORRIDOR OF BORDERING STATES TO OPERATE IN ARIZONA WITHOUT ARIZONA REGISTRATION

ARIZONA

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

CAR INSPECTION PROGRAMS

- NO SAFETY INSPECTION PROGRAM
- PILOT EMISSIONS INSPECTION PROGRAM RUN BY STATE DEPARTMENT OF HEALTH NOW IN OPERATION - UTILIZES KEY MODE TEST PROCEDURE
- EMISSIONS INSPECTION CURRENTLY IS MANDATORY FOR STATE VEHICLES - VOLUNTARY FOR PRIVATE VEHICLES
- PROGRAM IS FORERUNNER OF MANDATORY EMISSIONS INSPECTION SCHEME ENVISAGED FOR PHOENIX/TUCSON AREA - FULL SCALE PROGRAM REQUIRES ENABLING LEGISLATION - WILL BE BASED ON PILOT PROGRAM RESULTS TO BE REPORTED TO LEGISLATURE IN 1974 - ABOUT 22 STATIONS ANTICIPATED
- PROGRAM STANDARDS AND PROCEDURES TO BE ESTABLISHED BY DEPARTMENT OF HEALTH - OPERATION AND ADMINISTRATION TO BE HANDLED BY DEPARTMENT OF HIGHWAYS, MOTOR VEHICLE DIVISION

ARIZONA

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

RETROFIT PROGRAM

- NO RETROFIT PROGRAM IN FORCE
- DEPARTMENT OF HEALTH HAS LEGAL AUTHORITY TO CERTIFY RETROFIT DEVICES - HAS RECOMMENDED THAT RETROFIT DEVICES BE TESTED - NO ACTION TO DATE
- ARIZONA RETROFIT MAY IGNORE 1967 AND OLDER CARS - ESTIMATED TO CONSTITUTE ONLY 25% OF VEHICLE POPULATION BY 1975

ARIZONA

REGION PECULIAR FACTORS

- STATE PASSENGER VEHICLE REGISTRATION IS ABOUT 890,000 - 84% OF CARS ARE IN PHOENIX/TUCSON BASIN
- 6.4 MILLION OUT-OF-STATE PASSENGER CARS ENTERED ARIZONA IN 1971 (7 times state registration)
- APPROXIMATELY 12% OF VEHICLE MILES TRAVELLED IN AIR BASIN ATTRIBUTABLE TO OUT-OF-STATE CARS
- APPROXIMATELY 30% OF VEHICLE MILES TRAVELLED ON STATE HIGHWAYS ATTRIBUTABLE TO OUT-OF-STATE CARS
- HIGH AMBIENT TEMPERATURES MAY NEGATE POSSIBLE USE OF VACUUM ADVANCE SPARK DISCONNECT AS RETROFIT TECHNIQUE

COLORADO

REACTION TO TWO-CAR STRATEGY

- DENVER METROPOLITAN AREA MUST BE CONTROLLED IN ORDER TO MEET NATIONAL AIR QUALITY STANDARDS
  - ALTITUDE ADJUSTMENT ALSO REQUIRED
- EFFECTIVE ENFORCEMENT DEMANDS STATEWIDE CONTROL
  - NO EXISTING OR PROPOSED LAWS TO ENFORCE REGIONAL CONTROLS
- LEGISLATURE IS AGAINST STRATEGY LIMITED TO THE DENVER AIR BASIN
- ONE YEAR IMPLEMENTATION IS INSUFFICIENT TO IMPROVE THE AIR QUALITY
  - NEW CAR SALES ARE 10% OF CAR POPULATION OF WHICH 29% ARE SMALL FOREIGN CARS
- CAR SALES WOULD BE ADVERSELY AFFECTED
  - A 6% SALES TAX IN DENVER HAS REDUCED CAR SALES IN DENVER
    - AN ADDED COST FOR LOCAL EMISSION CONTROL WOULD FURTHER DECREASE SALES
  - DISTANCE TO NEXT AIR BASIN IS LESS THAN 60 MILES
    - EASY TO PURCHASE CAR OUT OF CONTROL REGION
  - POSTAL BOX NUMBER IS AN ACCEPTABLE REGISTRATION ADDRESS

COLORADO

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

VEHICLE REGISTRATION CONTROL

- NO ACTUAL RESIDENCE VERIFICATION
- REGISTRATION SURVEILLANCE IMPRACTICABLE WITH PRESENT MANPOWER AND BUDGET
- NO ENFORCEMENT POLITICALLY POSSIBLE BELOW COUNTY LEVEL
- POSTAL BOX NUMBER IS A LEGAL RESIDENCE
- NEW RESIDENTS MUST REGISTER WITHIN 30 DAYS OF ESTABLISHING RESIDENCE
- MANUAL HANDLING OF REGISTRATION/NO COMPUTER RECORDS
- MONTHLY STAGGERED STATE WIDE REGISTRATION
- A CAR IS DEEMED TO BE A USED CAR AFTER FIRST SALE

COLORADO

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

INSPECTION PROGRAMS

- STATEWIDE AUTOMOBILE SAFETY INSPECTION MANDATORY TWICE A YEAR/NOT RELATED TO REGISTRATION
- THE LEGISLATURE HAS NOT ENACTED LAWS FOR AUTOMOBILE EMISSION INSPECTIONS AND IS NOT LIKELY TO DO IT THIS YEAR
- PROPOSED INSPECTION PROGRAM TO BE CONCURRENT WITH SAFETY INSPECTION PROGRAM AND TO BE STATEWIDE
- PROPOSED INSPECTION PROGRAM TO BE MADE BY STATE LICENSED MECHANICS WITH REPAIRS PERMISSIBLE ON THE SPOT
- PROPOSED INSPECTION PROGRAM TO USE IDLE TEST
- PRESENT PLANS WOULD SET THE EMISSION STANDARDS ANNUALLY SO THAT 30% OF TESTED CAR WOULD FAIL INSPECTION
- EFFECTIVITY IS SEEN IN 1980 AT THE EARLIEST

RETROFIT PROGRAMS

- EMISSION CONTROL RETROFIT PROGRAM HAS NOT BEEN AUTHORIZED/NONE LIKELY IN NEAR FUTURE
- EGR + VACUUM SPARK RETARD IS FAVORED AS A POSSIBLE RETROFIT KIT

COLORADO

REGION PECULIAR SITUATIONS

- COLORADO REQUIRES AN EXEMPTION FROM THE FACTORY SET NON-TAMPERING FEDERAL REGULATION BECAUSE HIGH ALTITUDES
    - MOST AUTOS OPERATED AT 5000 ft ELEVATION
    - CARBURATORS IN EXISTENCE OR IN DEVELOPMENT CANNOT HANDLE THE ALTITUDE COMPENSATION RANGE REQUIRED IN COLORADO TO MEET FEDERAL STANDARDS
    - FACTORY TUNING RESULTS IN IMPROPER VEHICLE OPERATION IN COLORADO
    - ALL CURRENTLY USED VACUUM OPERATED DEVICES REQUIRE CHANGE OF SPRINGS TO OPERATE PROPERLY
    - CAR TUNED PER MANUFACTURER'S SPECIFICATIONS SHOWS A 160-170% INCREASE IN CO AND HC EMISSIONS AT 5000 ft ELEVATION
- 1,179,199 PASSENGER CARS REGISTERED IN STATE IN 1971
- 694,383 PASSENGER CARS REGISTERED IN DENVER AIR REGION (58.9%) IN 1971
- 10% OF STATE CAR POPULATION ARE NEW CARS, OF WHICH 28.6% ARE FOREIGN IMPORTS

MARYLAND

REACTIONS TO TWO-CAR STRATEGY

- CALIFORNIA-ONLY STRATEGY WOULD IMPACT MANYLAND AIR QUALITY IMPLEMENTATION PLAN - WOULD REQUIRE HEAVIER RELIANCE ON OTHER TRANSPORTATION CONTROL STRATEGIES
- TWO-CAR STRATEGY WITHIN STATE IS COMPLICATED BUT COULD BE WORKED OUT - THEY WOULD NOT WORRY ABOUT VEHICLE REGISTRATION CONTROL FOR ONE YEAR PERIOD
- SIMPLER TO HAVE SAME CONTROLS FOR ENTIRE STATE
- WASHINGTON DC METRO AREA (with two Maryland Counties) AS CONTROL REGION WITH BALTIMORE EXCLUDED WOULD CREATE PROBLEMS
- WOULD PREFER 1975 EMISSION STANDARDS OR BEST DELIVERABLE DETROIT STANDARDS FOR EVERYONE
- DO NOT FAVOR PERMANENT TWO-CAR STRATEGY

MARYLAND

BACKGROUND EXPERIENCE RELATED TO VEHICLE CONTROL

- VEHICLE REGISTRATION CONTROL
    - REGISTRATION IDENTIFIED BY COUNTY AND ZIP CODE
    - CHECK ON CAR NOW POSSIBLE ONLY ON TRANSFER OF TITLE
- INSPECTION PROGRAMS
    - SAFETY INSPECTION ONLY ON TRANSFER OF TITLE
    - SAFETY INSPECTION WITH STATE LICENSED GARAGES (2000 garages in state)
    - NO EMISSIONS INSPECTION NOW - NO ENABLING LEGISLATION
- RETROFIT PROGRAM
    - RETROFIT PROGRAM INCORPORATED IN STATE AIR QUALITY IMPLEMENTATION PLAN
    - NO LEGISLATION FOR RETROFIT PROGRAM

MARYLAND

REGION PECULIAR FACTORS

- STATE LEGISLATURE MEETS ONLY FOR THREE MONTHS OF EACH YEAR - COULD IMPACT ON RESPONSE TIME FOR LEGISLATION IF REQUIRED

- STATE OF MARYLAND COULD CONTAIN TWO CONTROL REGIONS - BALTIMORE AREA AND COUNTIES IN WASHINGTON METRO AREA

- FIVE PERCENT OF THROUGH TRAFFIC IN AND OUT OF BALTIMORE IS FROM OUT-OF-STATE - CAN'T CONTROL THIS

MASSACHUSETTS

REACTIONS TO TWO-CAR STRATEGY

- CALIFORNIA-ONLY STRATEGY WOULD IMPACT AIR QUALITY IMPLEMENTATION PLANS - WITH 1975 EMISSION STANDARDS FOR NEW CARS, THEY JUST MEET CO AIR QUALITY STANDARDS IN 1977

- FORESEE MANY PROBLEMS WITH REGIONAL TWO-CAR STRATEGY IN STATE - ANTICIPATE ADVERSE SENTIMENT OF DISCRIMINATION AGAINST PEOPLE IN METROPOLITAN AREA HAVING TO PURCHASE MORE EXPENSIVE CARS

- IF BOSTON AREA ONLY IS REGIDLY CONTROLLED, EXCLUSION OF SPRINGFIELD, MASSACHUSETSS MIGHT BE QUESTIONED - IT HAS CO PROBLEM SIMILAR TO BOSTON

- WOULD LIKE TO SEE ONE CLASS OF LOW EMISSION CARS

MASSACHUSETTS

BACKGROUND EXPERIENCE RELATED TO VEHICLE CONTROL

- VEHICLE REGISTRATION CONTROL
  - STAGGERED REGISTRATION BY MAIL OR PAYMENT AT REGISTRY OFFICE
  - NO-FAULT INSURANCE REQUIRED - NEED PROOF OF INSURANCE TO GET REGISTRATION (certification form filled out by insurance company)
  - NO ENFORCEMENT BY STATE - ONLY SPOT CHECK BY INSURANCE COMPANIES, WHO HAVE INCENTIVE BECAUSE OF POTENTIALLY LARGE RATE DIFFERENTIAL FOR DIFFERENT LOCALITIES. MANY BOSTON STUDENTS USE HOME ADDRESSES TO GET LOW RATES
  - FALSE ADDRESS ON INSURANCE COULD INVALIDATE INSURANCE COMPANY'S LIABILITY
- INSPECTION PROGRAMS
  - SEMI-ANNUAL SIMPLE SAFETY INSPECTION NOW, BY PRIVATE GARAGES (inspection deadlines - April 15 and October 15)
  - PROOF OF REGISTRATION NEEDED TO GET INSPECTION STICKER
  - NO REAL CONTROL ON ISSUANCE OF STICKERS - EASY TO OBTAIN
  - MAINTENANCE AND EMISSIONS INSPECTION RECOMMENDED IN IMPLEMENTATION PLAN - BUT NO ENABLING LEGISLATION
- RETROFIT PROGRAMS
  - NONE NOW; NO ENABLING LEGISLATION

MASSACHUSETTS

REGION-PECULIAR FACTORS

- ONLY VERY LIMITED AREA IN BOSTON HAS BAD CO PROBLEM - CAN ACHIEVE COMPLIANCE GIVEN TIME
- THEY ALSO HAVE OXIDANT PROBLEM (on paper) IN BOSTON, BUT INCIDENCE IS RARE IN REALITY. STILL SOME WAY TO GO ON MEETING OXIDANT STANDARDS

MINNESOTA

REACTIONS TO TWO-CAR STRATEGY

- TWO-CAR STRATEGY IS GREAT FOR CALIFORNIA-ONLY CASE
- STRONGLY OPPOSE METROPOLITAN REGIONAL CONTROL IF MINNEAPOLIS IS INCLUDED
- AIR QUALITY STANDARDS EXCEEDED ONLY IN DOWNTOWN MINNEAPOLIS - 1974 EMISSION STANDARD ACCEPTABLE IF TRAFFIC STRATEGIES WORK
- ONLY PROBLEM IS CO BEING 9.5% OVER AIR QUALITY STANDARDS IN 1975 - EXPECT PROBLEM TO DISAPPEAR IN 1976

MINNESOTA

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

- VEHICLE REGISTRATION CONTROL
  - YEARLY REGISTRATION - COUNTY IDENTIFIED
  - REGISTRATION CARD NOT REQUIRED TO BE CARRIED IN VEHICLE NOR ON THE PERSON OF THE OWNER
- INSPECTION PROGRAMS
  - NO MANDATORY SAFETY INSPECTION
  - NO EMISSION INSPECTION EXISTING OR PLANNED
- RETROFIT PROGRAM
  - NON PLANNED

REGION-PECULIAR FACTORS

- MOST OF STATE IS RURAL - THEY DO NOT SEE NECESSITY FOR RIGID CONTROL IF NON-OPTIMUM EMISSION CONTROL SYSTEM IS REQUIRED

NEW JERSEY

REACTIONS TO TWO-CAR STRATEGY

- STATEWIDE CONTROL IS THE ONLY FEASIBLE OPTION BECAUSE OF THE INTRASTATE PROXIMITY OF METROPOLITAN POPULATION CENTERS
- BULK OF TRAFFIC INTO AND THROUGH NEW JERSEY IS FROM NEW YORK AND PHILADELPHIA, MAKING THE EFFECTIVITY OF A NEW JERSEY ONLY CONTROL SCHEME QUESTIONABLE
- NO MECHANISM EXISTS FOR CONTROL OF OUT-OF-STATE REGISTRATIONS BY VEHICLES DOMICILED IN NEW JERSEY -- THIS COULD BECOME SIGNIFICANT IF PRICE DIFFERENTIAL BETWEEN TWO CLASSES OF CARS WAS LARGE
- INTERSTATE REGIONAL CONTROL BY COALITION OF STATE GOVERNMENTS WOULD BE BEST, BUT THE POSSIBILITIES FOR A COOPERATIVE VENTURE OF THIS KIND SEEM REMOTE

NEW JERSEY

BACKGROUND EXPERIENCE RELATED TO VEHICLE CONTROL

VEHICLE REGISTRATION CONTROL

- YEARLY REGISTRATION IS MANDATORY (on anniversary of vehicle purchase)
- REGISTRATION IS NOT IDENTIFIED BY COUNTY OR OTHER LOCAL JURISDICTION
- VALID SAFETY INSPECTION CERTIFICATE IS A CONDITION OF REGISTRATION
- LAW REQUIRES NEW RESIDENTS TO REREGISTER VEHICLES IN NEW JERSEY WITHIN 6 MONTHS -- THERE IS NO OVERT ENFORCEMENT OF THIS REQUIREMENT
- TRUCK INDUSTRY REGISTERS VEHICLES OUT-OF-STATE BUT USES DEPOTS WITHIN STATE -- BORDER RESIDENTS CONTINUE TO RENEW OUT-OF-STATE FOR FEE OR INSPECTION ADVANTAGES -- THERE IS NO MECHANISHM FOR EFFECTIVELY CONTROLLING THIS

NEW JERSEY

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

SAFETY INSPECTION PROGRAM

- YEARLY INSPECTION REQUIRED AS A CONDITION FOR REGISTRATION
- INSPECTIONS CONDUCTED AT 40 STATE OWNED AND OPERATED STATIONS - TOTAL OF 69 INSPECTION LANES - MOTORIST CAN USE ANY CONVENIENT STATION LOCATION THROUGHOUT STATE
- INSPECTION TIME IS 5 MINUTES (waits up to one hour) - INCLUDES BRAKES, BALL JOINTS, HORNS, LIGHTS, WIPERS
- IN EVENT OF FAILURE, OWNER GETS TWO WEEKS FOR REPAIR AND REINSPECTION
- REPAIR OR ADJUSTMENT CAN BE MADE AT ANY GARAGE - FAULTY REPAIR OR UNNEEDED WORK HAS BEEN BASIS FOR CRITICISM OF THE N.J. SYSTEM
- VALID INSPECTION IS IDENTIFIED BY COLOR-CODED WINDSHIELD STICKER

NEW JERSEY

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

EMISSIONS INSPECTION PROGRAM

- PROGRAM INITIATED JULY, 1972
- COMBINES EMISSIONS INSPECTION WITH EXISTING SAFETY INSPECTION OPERATION
- HC AND CO TESTED AT IDLE AND COMPARED WITH SPECIFIED INSPECTION STANDARDS FOR VEHICLE MODEL YEAR
- STANDARDS TO BE MADE PROGRESSIVELY MORE SEVERE - CURRENT FAIL RATE IS ABOUT 10 PERCENT: WILL INCREASE TO 1/3 BY JULY, 1975
- AT PRESENT, REPAIR OR ADJUSTMENT FOLLOWING EMISSIONS TEST FAILURE IS ON VOLUNTARY BASIS: BECOMES MANDATORY JULY 1, 1973
- TO DATE HAVE TESTED OVER ONE MILLION CARS - 11 PERCENT HAVE FAILED
- 40 PERCENT OF FAILED VEHICLES GETTING VOLUNTARY REPAIRS/ADJUSTMENTS FAIL A SECOND TIME, PRIMARILY AS A RESULT OF INADEQUATE MECHANIC TRAINING
- ULTIMATELY, FAILURE OF EITHER EMISSIONS OR SAFETY TEST WOULD BE BASIS FOR DENYING VEHICLE REGISTRATION

NEW JERSEY

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

RETROFIT PROGRAM

- NEW JERSEY TRANSPORTATION CONTROL PLAN INCLUDES A PROPOSED RETROFIT STRATEGY
- INITIAL APPROACH WOULD BE TO UTILIZE EQUIPMENT ALREADY CERTIFIED BY STATE OF CALIFORNIA
- TO BE EFFECTIVE, THE PROGRAM WOULD REQUIRE RETROFIT ON A STATEWIDE OR INTERSTATE REGIONAL BASIS, AND WOULD FURTHER REQUIRE ALL VEHICLES OPERATING WITHIN CONTROL BOUNDARIES TO BE EQUIPPED
- ENFORCEMENT WOULD TAKE THE FORM OF TIGHTENING INSPECTION STATION STANDARDS, ALONG WITH EMISSIONS ROAD CHECKS SIMILAR TO THE CALIFORNIA PVI PROGRAM

NEW JERSEY

REGION-PECULIAR FACTORS

- PASSENGER VEHICLE REGISTRATION IS ABOUT 3-1/4 MILLION
- NEW JERSEY IS SANDWICHED BETWEEN TWO LARGE OUT-OF-STATE METROPOLITAN CENTERS AND IS SUBJECT TO SIGNIFICANT TRAFFIC FROM AND BETWEEN THESE CENTERS
- 88 PERCENT OF NEW JERSEY CARS ARE LOCATED IN TWO AIR QUALITY CONTROL REGIONS: METROPOLITAN PHILADELPHIA INTERSTATE REGION AND NEW JERSEY - NEW YORK - CONNECTICUT INTERSTATE REGION

NEW YORK

REACTIONS TO TWO-CAR STRATEGY

- NEW YORK CITY
  - NEW YORK METROPOLITAN AREA MUST BE ONE OF THE STRINGENTLY CONTROLLED REGIONS IF TRANSPORATION CONTROL PROGRAM TO MEET AIR QUALITY GOALS ARE TO BE MET
  - PRACTICALLY SPEAKING, ONLY THE NEW YORK METROPOLITAN REGION AND SURROUNDING COUNTIES WOULD NEED TO BE CONTROLLED
  - RETROFIT OF CARS TAKING UP RESIDENCE IN NEW YORK MAY BE AN ISSUE
  - FOR ONE YEAR PROGRAM, TRAFFIC INTO AREA FROM UNCONTROLLED REGIONS COULD BE NEGLECTED; FOR EXTENDED PROGRAM, MIGHT CONSIDER A DETERRENT SUCH AS CITY DAY USE TAX
  - INSTITUTIONAL PROBLEMS RELATED TO THE IMPLEMENTATION AND ADMINISTRATION OF A LOCAL CONTROL PROGRAM COULD BE SEVERE

NEW YORK

REACTIONS TO TWO-CAR STRATEGY (Cont'd)

- NEW YORK STATE
  - REGIONAL CONTROL PROGRAM IS ACCEPTABLE IF IT IS THE ONLY PRACTICAL WAY TO IMPLEMENT 1975 EXHAUST EMISSION STANDARDS
  - IN ADDITION TO NEW YORK CITY, OTHER AREAS SUCH AS SCHENECTADY SHOULD BE CONSIDERED FOR CONTROL
  - STATEWIDE CONTROL MAY INVOLVE LESS OF AN ADMINISTRATION PROBLEM, BUT FROM THE STANDPOINT OF COST, AND EFFECTIVITY, LOCAL CONTROL (where required) MAKES MORE SENSE
  - CARS ENTERING THE METROPOLITAN AREA FROM LESS CONTROLLED REGIONS MAY MAKE ATTAINMENT OF LOCAL AIR QUALITY GOALS MORE DIFFICULT -- HOWEVER, FOR A ONE-YEAR PROGRAM, THIS ADDITIONAL BURDEN MAY BE ACCEPTABLE
  - DMV BELIEVES IT WOULD BE EASY FOR THE 5 COUNTIES OF NYC TO ISSUE STICKER IDENTIFYING COMPLIANCE WITH 1975 EMISSION CONTROLS - CURRENTLY CONSIDERING STICKER SYSTEM FOR USE IN CONNECTION WITH PROPOSED METROPOLITAN NYC RETROFIT PROGRAM

NEW YORK
EXPERIENCE/BACKGROUND RELATED TO VECHICLE CONTROL

VEHICLE REGISTRATION CONTROL

- MANDATORY TO REGISTER EACH YEAR -- REGISTRATION IS STAGGERED THROUGHOUT REGISTRATION YEAR (January - December) -- IMPLEMENTED BY MAIL INVITATIONS
- REGISTRATION NOT ON COUNTY BASIS -- ADDRESS OF RESIDENCE ON REGISTRATION USED SOLELY FOR RENEWAL INVITATIONS. THERE IS NO LAW WHICH REQUIRES REGISTRANT TO REVEAL ADDRESS OF DOMICILE OR PREVENTS HIM FROM GIVING ANOTHER ADDRESS
- PROOF OF VEHICLE SAFETY INSPECTION (both new and used cars) ALONG WITH PROOF OWNERSHIP AND INSURANCE IS REQUIRED FOR REGISTRATION
- VALID RESIDENT REGISTRATIONS ARE IDENTIFIED BY LICENSE TAG STICKER COLOR AND PRINTED EXPIRATION DATE
- NEW YORK LICENSE TAGS ARE TRANSFERRED FROM VEHICLE TO VEHICLE BY REGISTRANT
- OUT OF STATE CARS REQUIRED TO REGISTER WITHIN 60 DAYS FROM ESTABLISHMENT OF RESIDENCY IN NEW YORK

NEW YORK
EXPERIENCE/BACKGROUND RELATED TO VEHICLE CONTROL

CAR INSPECTION PROGRAMS

- NY SAFETY INSPECTION PROGRAM HAS BEEN IN OPERATION SINCE 1956
- SAFETY INSPECTION REQUIRED FOR NEW VEHICLES, UPON TRANSFER OF OWNERSHIP, AND YEARLY THEREAFTER WITHIN ONE YEAR FROM LAST DAY OF MONTH IN WHICH LAST SUCCESSFUL INSPECTION COMPLETED
- INSPECTIONS CONDUCTED BY 11,000 PRIVATELY OWNED STATIONS (2400 in NYC), LICENSED AND SUPERVISED BY STATE -- INSPECTION COSTS $3 -- VALID CARDS ARE ISSUED COLOR-CODED AND DATED WINDSHIELD STICKER
- PART OF INSPECTION FEE RETURNED TO STATE AND IS USED TO FINANCE A SPECIAL POLICE ENFORCEMENT AND INSPECTION GROUP WHICH ALSO INVESTIGATES ALLEGED MALPRACTICES
- NO EMISSIONS INSPECTION PROGRAM CURRENTLY IN FORCE
- STATE IMPLEMENTATION PLAN PROVIDES FOR EMISSION INSPECTION PROGRAM -- 800 STATE FRANCHISED INSPECTION STATIONS, 140 IN NY METROPOLITAN AREA BY 1975 -- TAXICABS: THRICE YEARLY; HEAVY DUTY: TWICE YEARLY; PASSENGER CARS: ONCE YEARLY

NEW YORK

EXPERIENCE/BACKGROUND RELATED TO VEHICLE CONTROL

RETROFIT PROGRAMS

- NO PROGRAMS CURRENT
- STATE IMPLEMENTATION PLAN PROPOSES:
  - METROPOLITAN NY AREA: CATALYST SYSTEM RETROFIT FOR ALL CARS 1974 MY AND OLDER
  - ALL OTHER AREAS WHERE NECESSARY: AIR-BLEED SYSTEM RETROFIT FOR PRE-1968 MY CARS
- LEGISLATION PROPOSED BUT NOT YET PASSED * -- VEHICLE CODE STATES THAT EMISSIONS INSPECTION WILL BE ADDED TO SAFETY INSPECTION PROGRAM AS SOON AS A PRACTICAL SCHEME HAS BEEN DEFINED BY THE DMV IN CONSULTATION WITH THE COMMISSIONER OF ENVIRONMENTAL CONSERVATION

* NY State Legislature adjourns in April -- reconvenes January 1974

NEW YORK

REGION-PECULIAR FACTORS

- 6.1 MILLION PASSENGER CARS REGISTERED IN STATE
- 1.6 MILLION PASSENGER CARS REGISTERED IN NEW YORK CITY
- 21% OF MANHATTAN CAR POPULATION IS NEW EACH YEAR
- 75,000 CARS PER DAY (4.6% OF NYC registrations) ENTER NYC FROM OUTSIDE METROPOLITAN AREA
- 60% OF NYC TAXI FLEET OR ABOUT 11,000 VEHICLES OPERATE IN MANHATTAN. THESE ACCOUNT FOR 60% OF THE DOWNTOWN/MIDTOWN VMT AND CONTRIBUTE 40% OF THE CO EMISSIONS. 45% IS CONTRIBUTED BY TRUCKS AND ABOUT 15% BY PASSENGER CARS
- CONTROLLING TAXIS/NEW PASSENGER CARS TO 1974 INSTEAD OF 1975 STANDARDS WOULD REDUCE CO EMISSION REDUCTION IN 1975 FROM 50 TO 20 PERCENT (midtown Manhattan)
- ON A METROPOLITAN-WIDE BASIS, CO IS NOT TOO BAD A CONTROL PROBLEM. REAL DIFFICULTY IS MEETING OXIDANT STANDARD -- HC EMISSIONS IN 1975 HAVE TO BE REDUCED BY 51 PERCENT, EITHER BY RETROFIT OR REDUCTION IN VMT

OREGON

REACTIONS TO TWO-CAR STRATEGY

- PORTLAND METROPOLITAN AREA MUST BE CONTROLLED IN ORDER TO MEET NATIONAL AIR QUALITY STANDARDS
- EFFECTIVE ENFORCEMENT DEMANDS STATEWIDE CONTROL
  - NO EXISTING OR PROPOSED LAWS TO ENFORCE TWO CAR CONTROL STRATEGY
- LOCAL RESTRICTIONS ARE LIKELY TO BE UNPOPULAR
  - PREVIOUS POOR EXPERIENCE ENCOUNTERED WITH AUTOMOBILE SAFETY CONTROL LIMITED TO THE PORTLAND METROPOLITAN AREA
  - ON THE OTHER HAND, CONTROL WITHIN ENTIRE PORTLAND AIR BASIN IMPOSSIBLE TO JUSTIFY - SEVEN COUNTIES OUT OF TEN ARE MOSTLY RURAL
- OREGON SUGGESTS CONTROL ZONE COMPRISED OF THREE COUNTIES CONTAINING 85% OF PORTLAND TRAFFIC
- ONE YEAR IMPLEMENTATION HAS LITTLE IMPACT SINCE NEW CAR SALES ARE ONLY 7.5% OF CAR POPULATION
- CAR SALES WOULD BE ADVERSELY AFFECTED
  - DISTANCE TO RURAL REGIONS IS SHORT
  - DIFFICULT TO GET LAWS RESTRICTING DEALER COMMERCE TO LOCAL MARKETS

OREGON

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

VEHICLE REGISTRATION CONTROL

- YEARLY REGISTRATION MANDATORY
- REGISTRATION PROCEDURE COMPUTERIZED
- MONTHLY STAGGERED STATEWIDE REGISTRATION
- REGISTRATION STATISTICS BY POSTAL ZIP CODE/COUNTY
- REGISTRATION SURVEILLANCE IMPRACTICABLE WITH PRESENT MANPOWER AND BUDGET
- BUSINESS ADDRESS OR POSTAL BOX NUMBER IS A LEGAL RESIDENCE
- NEW RESIDENTS MUST REGISTER AFTER OUT-OF-STATE REGISTRATION EXPIRES
- ONCE REGISTERED VEHICLE IS DEFINED AS A USED CAR

OREGON

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

CAR INSPECTION PROGRAMS

- NO SAFETY OR EMISSION CONTROL PROGRAMS
- DEPARTMENT OF ENVIRONMENTAL QUALITY HAS AUTHORITY TO IMPLEMENT AN INSPECTION PROGRAM
  - NO BUDGET ALLOCATED
  - BEING DEBATED IN LEGISLATURE
- NO ACTUAL EXPERIENCE WITH EMISSION SYSTEM INSPECTIONS
- INSPECTION PROGRAM TO BE RUN BY STATE AND TIED IN WITH AUTOMOBILE REGISTRATION
- INSPECTION PROGRAM IS FOR PORTLAND AREA ONLY
  - 3 COUNTIES OF 10 IN BASIN
- INSPECTION PROGRAM TO USE KEY-MODE TEST
- PROPOSED EFFECTIVITY IS 1 JANUARY 1974 WITH MANDATORY REPAIRS STARTING 1 JANUARY 1975
- STATEWIDE INSPECTION PLAN WAS NOT FORMULATED
  - COULD ONLY JUSTIFY 3 COUNTIES SINCE OTHERS HAD NO AUTO POLLUTION PROBLEM
  - STUDIES SHOWED MOST TRAFFIC IN 3 COUNTIES
  - REGIONAL INSPECTION STRATEGY WAS ACCEPTED BECAUSE OF LIMITED PROBLEM AREA

OREGON

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

RETROFIT PROGRAM

- NO RETROFIT PROGRAM PLANNED
- NOT JUSTIFIED IN VIEW OF OREGON AIR QUALITY CONDITIONS

OREGON

REGION PECULIAR FACTORS

- 1,361,203 PASSENGER CARS REGISTERED IN STATE IN 1972
- 545,601 PASSENGER CARS REGISTERED IN TRI-COUNTY PORTLAND AREA (40%)
- 7.5% OF STATE CAR POPULATION ARE NEW CARS
- PORTLAND AIR BASIN IS LARGELY RURAL ONLY 3 COUNTIES OUT OF 10 WOULD BENEFIT BY CONTROLS
- FIVE WASHINGTON COUNTIES IN PORTLAND AIR BASIN CONTRIBUTE ONLY 6% TO THE PORTLAND CITY TRAFFIC

PENNSYLVANIA

REACTIONS TO TWO-CAR STRATEGY

- CALIFORNIA-ONLY STRATEGY WOULD RESULT IN SERIOUS COMPROMISE OF PENNSYLVANIA AIR QUALITY IMPLEMENTATION PLANS -- EVEN WITH 1975 EXHAUST EMISSION LEVELS, NEEDED TRANSPORTATION CONTROLS CALL FOR 30% VMT REDUCTION IN PITTSBURGH, 50% VMT REDUCTION IN PHILADELPHIA
- THESE TWO METROPOLITAN AREAS ACCOUNT FOR 50% OF THE AUTOMOBILES IN THE STATE -- NEVERTHELESS, CONTROL WOULD HAVE TO BE IMPLEMENTED STATEWIDE TO MAKE ENFORCEMENT OF PROGRAM FEASIBLE
- FURTHER REQUIRED TO INCLUDE THE FIVE NEW JERSEY COUNTIES IN THE METROPOLITAN PHILADELPHIA INTERSTATE AQCR WITHIN THE ZONE OF CONTROL IN ORDER FOR THE PROGRAM TO BE EFFECTIVE WITH RESPECT TO LOCAL AIR QUALITY OBJECTIVES

PENNSYLVANIA

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

VEHICLE REGISTRATION CONTROL

- YEARLY REGISTRATION IS MANDATORY
- REGISTRATION NOT IDENTIFIED BY COUNTY - HARRISBURG DMV FACILITY PROCESSES ALL REGISTRATION APPLICATIONS VIA DIRECT MAILING
- REGISTRATION NOT TIED TO EXISTING SAFETY INSPECTION PROGRAM - NO PROOF OF VALID INSPECTION REQUIRED
- OUT-OF-STATE VEHICLES REQUIRED TO REGISTER WITHIN 30 DAYS OF ESTABLISHING PENNSYLVANIA RESIDENCY -- THERE IS NO OVERT CONTROL PROGRAM TO ENFORCE THIS
- ADDRESS OF RECORD NEED NOT COINCIDE WITH LOCATION OF DOMICILE FOR VEHICLE

PENNSYLVANIA

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

SAFETY INSPECTION PROGRAM

- IN OPERATION 20 YEARS
- NOT TIED TO VEHICLE REGISTRATION (Bureau of Traffic Safety vs Bureau of Motor Vehicles)
- VEHICLES INSPECTED TWICE A YEAR
- INSPECTIONS CONDUCTED IN 16,000 STATE-CERTIFIED, PRIVATELY OWNED STATIONS (a major part of Pennsylvania garage facilities)
- NO OFFICIAL FEE LIMIT
- COMPLIANCE DESIGNATED BY COLOR-CODED AND DATED WINDSHIELD INSPECTION STICKER
- STATIONS INSPECTED TWICE YEARLY BY STATE POLICE (penalty for malpractice: $200 fine, loss of certification)
- MECHANIC RECERTIFICATION EVERY THREE YEARS MANDATORY
- MECHANIC UPGRADING PROGRAM IS UNDERWAY; TASK IS MASSIVE BECAUSE OF LARGE NUMBER OF CERTIFIED STATIONS

PENNSYLVANIA

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

EMISSION INSPECTION PROGRAM

- NO PROGRAM FOR EMISSIONS INSPECTION CURRENTLY IN FORCE
- STATE TRANSPORTATION CONTROL STRATEGY PROPOSES SEVERAL INSPECTION/MAINTENANCE PROGRAM ALTERNATIVES
- MOST COST-EFFECTIVE APPROACH IS STATE-RUN INSPECTION STATIONS LIMITED TO VEHICLES IN PHILADELPHIA AND PITTSBURGH AREA
- NO EXISTING AUTHORITY IN PRESENT LEGISLATION FOR STATE-OPERATED FACILITIES OR TO GEOGRAPHICALLY LIMIT INSPECTION PROGRAMS
- ACT PASSED BY PENNSYLVANIA GENERAL ASSEMBLY PROVIDES FOR STATE-WIDE SEMI-ANNUAL EMISSION CONTROL DEVICE INSPECTION TIED TO SAFETY INSPECTION, REGULATED AS PRESCRIBED BY SECRETARY OF TRANSPORTATION - NO DEADLINE FOR IMPLEMENTATION OF THIS PLAN HAS BEEN SPECIFIED

PENNSYLVANIA

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

RETROFIT PROGRAM

- NO RETROFIT PROGRAM IN FORCE; NONE CONTEMPLATED
- TRANSPORTATION CONTROL STUDY CONSIDERED RETROFIT AS A CONTROL ALTERNATIVE BUT REJECTED IT BECAUSE OF DIFFICULTY OF IMPLEMENTATION AND LACK OF ENABLING LEGISLATION

PENNSYLVANIA

REGION-PECULIAR FACTORS

- TOTAL PASSENGER VEHICLE REGISTRATION IS ABOUT 5.3 MILLION

- 50 PERCENT OF ALL AUTOMOBILES IN THE STATE ARE LOCATED IN THE PHILADELPHIA AND PITTSBURGH AREA

- 95 PERCENT OF THE VMT IN THE PHILADELPHIA REGION AND IN THE PITTSBURG METROPOLITAN AREA ARE MADE BY VEHICLES DOMICILED IN THESE AREAS

- PROXIMITY OF PHILADELPHIA TO POPULATION CENTERS IN NEW JERSEY AS DEFINED BY THE METROPOLITAN PHILADELPHIA AIR QUALITY CONTROL REGION SUGGESTS THAT AN INTERSTATE CONTROL REGION BOUNDARY WOULD BE REQUIRED

TEXAS

REACTIONS TO TWO CAR STRATEGY

- HOUSTON-GALVESTON AND SOUTHEAST TEXAS-SOUTHERN LOUISIANA AIR BASINS ARE PREDOMINANTLY STATIONARY-SOURCE PROBLEM AREAS

- NEVERTHELESS, EXISTING AIR QUALITY IMPLEMENTATION PLANS WOULD BE COMPROMISED IF EMISSION INVENTORIES COULD NOT TAKE ADVANTAGE OF 1975 AUTOMOBILE EMISSION LEVELS

- ONE YEAR DELAY IN INTRODUCTION OF 1975 EMISSION STANDARDS WOULD REQUIRE IMPLEMENTATION OF BOTH MANDATORY INSPECTION/MAINTENANCE AND RETROFIT PROGRAMS

TEXAS

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

VEHICLE REGISTRATION CONTROL

- YEARLY VEHICLE REGISTRATION IS MANDATORY (Feb - Mar Period)
- REGISTRATION NOT TIED IN TO EXISTING SAFETY INSPECTION PROGRAM
- REGISTRATION IS PRIMARILY A TAX COLLECTION PROCESS - NO SPECIAL MEANS FOR ENFORCEMENT
- CHANGING VIN FOR THE PURPOSE OF AIDING VEHICLE IDENTIFICATION AND CONTROL WOULD REQUIRE DMV COMPUTER SOFTWARE CHANGES (might be possible) AND NEW STAFF FOR ENFORCEMENT WHERE NONE EXISTS AT THE PRESENT TIME

TEXAS

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

SAFETY INSPECTION PROGRAM

- ANNUAL SAFETY INSPECTION REQUIRED
- NOT TIED TO VEHICLE REGISTRATION
- PROGRAM IS ADMINISTERED BY DEPARTMENT OF SAFETY THROUGH STATE-LICENSED STATIONS - $2.00 FEE
- COMPLIANCE DESIGNATED BY COLOR-CODED AND DATED WINDSHIELD INSPECTION STICKER

TEXAS

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

EMISSIONS INSPECTION PROGRAM

- NO PROGRAM FOR EMISSIONS INSPECTION CURRENTLY IN FORCE
- FEDERAL LAW PROVISIONS ARE ONLY CONTROL ON EMISSIONS RELATED TO NEW CAR SALES. NO USED CAR EMISSION CONTROL REGULATIONS EXIST
- SAFETY INSPECTION INCLUDES VISUAL INSPECTION TO ENSURE THAT ORIGINAL EMISSION CONTROL EQUIPMENT HAS NOT BEEN REMOVED OR ALTERED
- HOUSE BILL 238 (in committee) WILL PROVIDE FOR STUDIES OF POSSIBLE MANDATORY INSPECTION/MAINTENANCE PROGRAMS
- THE STATE VIEW IS GENERALLY NEGATIVE TO INSPECTION/MAINTENANCE
- LEGAL AUTHORITY FOR INSPECTION/TESTING EXISTS IN TEXAS CLEAN AIR ACT - ADDITIONAL LEGISLATION IS REQUIRED TO IMPLEMENT SUCH PROGRAMS

TEXAS

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

RETROFIT PROGRAM

- NO RETROFIT PROGRAM IN FORCE; NONE CONTEMPLATED
- NO ENABLING LEGISLATION IS IN FORCE ALTHOUGH LEGAL AUTHORITY FOR RETROFIT EXISTS IN THE TEXAS CLEAN AIR ACT

TEXAS

REGION-PECULIAR FACTORS

- TOTAL PASSENGER CAR REGISTRATION IN STATE IS ABOUT 4.6 MILLION

- ABOUT ONE MILLION CARS (20% of Texas total) LOCATED IN HOUSTON AQCR - ABOUT 200,000 (4.6% of Texas total) LOCATED IN TEXAS PORTION OF TEXAS-LOUISIANA AQCR

- ENTIRE STATE HAS HC PROBLEM

- PREDOMINANTLY STATIONARY SOURCE PROBLEM AREAS INCLUDE: HOUSTON-GALVESTON (18% due to autos); SOUTHERN LOUISIANA-SOUTHEAST TEXAS (5% due to autos); AND CORPUS CHRISTY

- PREDOMINANTLY MOBILE SOURCE PROBLEM AREAS INCLUDE AUSTIN-WACO; DALLAS-FT. WORTH; SAN ANTONIO AND EL PASO

UTAH

REACTIONS TO TWO-CAR STATEGY

- TWO-CAR STRATEGY IS FINE IF UTAH IS NOT LOW EMISSION REGION

- PEOPLE IN UTAH NOT TOO EXCITED ABOUT AUTO POLLUTION PROBLEM - ADVERSE REACTION EXPECTED IF SALT LAKE CITY IS CONTROLLED REGION

- THEIR AUTO POLLUTION PROBLEM IS CO IN THE INNER CORE OF SALT LAKE CITY (2 miles x 3 miles)

- THEY EXAMINED A TYPE OF TWO-CAR STRATEGY WITH RESPECT TO RIGID CONTROLS IN INNER CORE OF SALT LAKE CITY - CONCLUDED THAT IT WOULD BE IMPOSSIBLE TO ADMINISTER

- CALIFORNIA-ONLY STRATEGY WILL HAVE MINIMAL EFFECT ON AIR QUALITY

UTAH

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

- VEHICLE REGISTRATION CONTROL
  - YEARLY REGISTRATION IN JANUARY-FEBRUARY
  - IDENTIFIED BY COUNTY AND COMMUNITY
  - NOT TIED IN WITH SAFETY
  - NO WAY TO KEEP TRACK OF REGISTERED CARS

- INSPECTION PROGRAMS
  - ANNUAL SAFETY INSPECTION AT STATE CERTIFIED GARAGES - STAGGERED SCHEDULE BY LAST DIGIT OR LICENSE PLATE
  - NO EMISSION INSPECTION - ENABLING LEGISLATION PASSED BY LAST LEGISLATURE, BUT NO PLANS

- RETROFIT PROGRAM
  - HAVE RETROFIT PLANS IN IMPLEMENTATION PLAN
  - NO REGULATION, ALTHOUGH RETROFIT COULD BE DONE UNDER INSPECTION LEGISLATION

UTAH

REGION PECULIAR FACTORS

- UTAH HAS SMALL POPULATION CONCENTRATED, BIG AREAS OF STATE ESSENTIALLY UNPOPULATED

- COUNTY SUCH AS TOOELE (included in Salt Lake City region) IS SPARSELY POPULATED. PROBLEM WOULD ARISE IF TOOELE WAS LOW EMISSION REGION AND WEBER COUNTY (not included in SLC region) WITH HIGHER POLLUTION HAD LESS CONTROLS

WASHINGTON, D. C.

REACTIONS TO TWO-CAR STRATEGY

- D.C. MUST BE INCLUDED AS ONE OF THE METROPOLITAN CONTROL REGIONS IF DISTRICT'S IMPLEMENTATION PLAN FOR ACHIEVING NATIONAL AIR QUALITY GOALS IS TO BE SUCCESSFUL
- EFFECTIVE ADMINISTRATION AND ENFORCEMENT OF THE PROGRAM MAY REQUIRE CONTROL THROUGHOUT THE ENTIRE STATES OF MARYLAND AND VIRGINIA
- AVAILABILITY OF UNLEADED GASOLINE FOR OUT-OF-REGION TRIPS IS A PROBLEM THAT MUST BE RESOLVED
- STRATEGY WILL NEVER WORK EFFECTIVELY UNLESS PRICE DIFFERENTIAL BETWEEN CONTROLLED AND LESS-CONTROLLED NEW CARS IS MINIMIZED
- FOR ONE-YEAR DURATION, PROGRAM MAY NOT BE WORTHWHILE--WOULD PREFER 1974 CONTROLS IF ACCOMPANIED BY A ONE-YEAR DELAY IN MEETING AIR QUALITY STANDARDS

WASHINGTON, D.C.

EXPERIENCE/BACKGROUND RELATED TO VEHICLE CONTROL

VEHICLE REGISTRATION CONTROL

- D.C. REGISTRATION MANDATORY EACH YEAR (registration year ends March 31)
- ALL VEHICLES BUT "FIELD SERVICE VEHICLES" (< 1%) ARE REGISTERED, INCLUDING DIPLOMATIC, FOREIGN NATIONAL, FEDERAL, AND DISTRICT GOVERNMENT VEHICLES
- REGISTRATION NOT TIED IN WITH YEARLY SAFETY INSPECTION WHICH FALLS ON ANNIVERSARY OF PURCHASE
- LICENSE TAGS ARE ASSIGNED TO REGISTRANT, NOT TRANSFERRED WITH CHANGE OF OWNERSHIP
- D.C. REGISTRATION REQUIRED WITHIN 30 DAYS FROM ESTABLISHING RESIDENCY IN DISTRICT
- MARYLAND DOES NOT REGISTER VEHICLES ON A COUNTY BASIS -- VIRGINIA REGISTERS ON A COUNTY AND (independent) CITY BASIS

WASHINGTON, D.C.
EXPERIENCE/BACKGROUND RELATED TO VEHICLE CONTROL

CAR INSPECTION PROGRAMS

- DISTRICT OF COLUMBIA
  - ANNUAL SAFETY INSPECTION FOR ALL D.C. REGISTERED CARS REQUIRED ON ANNIVERSARY OF NEW CAR PURCHASE OR FIRST REGISTRATION IN DISTRICT
  - CITY-RUN SYSTEM IN OPERATION SINCE 1939 --- TWO STATIONS, 4 LANES EACH, 1 LANE EQUIPPED FOR EMISSIONS - SAFETY INSPECTION ENFORCEMENT BASED ON COLOR-CODED/DATED WINDSHIELD STICKER
  - AT PRESENT, EMISSIONS INSPECTION REQUIRED ONLY FOR D.C. GOVERNMENT VEHICLES -- PILOT PROGRAM FOR EMISSION TESTS OF PRIVATE VEHICLES UNDERWAY -- ABOUT 1% OF VEHICLES CHECKED
  - EMISSION INSPECTION PROGRAM FOR ALL D.C. CARS APPROVED BY CITY COUNCIL AND MAYOR -- PROGRAM BUDGET INCLUDED IN D.C. BUDGET REQUEST TO CONGRESS

- MARYLAND
  - SAFETY INSPECTION REQUIRED ONLY ON VEHICLE RESALE -- NO EMISSIONS INSPECTION

- VIRGINIA
  - TWICE YEARLY SAFETY INSPECTION PROGRAM - NOT TIED TO VEHICLE REGISTRATION - CONDUCTED BY STATE-LICENSED PRIVATE GARAGES FOR $2.00 FEE - ENFORCED BY STATE POLICE ON BASIS OF COLOR-CODED/DATED WINDSHIELD STICKER
  - NO CURRENT EMISSIONS INSPECTION PROGRAM - HOPE TO IMPLEMENT INSPECTION PROGRAM TIED TO SAFETY PROGRAM RUN BY DMV

WASHINGTON, D.C.
EXPERIENCE/BACKGROUND RELATED TO VEHICLE CONTROL

RETROFIT PROGRAMS

- NO RETROFIT PROGRAM CURRENTLY IN FORCE

- COORDINATED RETROFIT PROGRAM FOR METROPOLITAN WASHINGTON AREA PROPOSED IN DISTRICT OF COLUMBIA, MARYLAND AND VIRGINIA IMPLEMENTATION PLANS
  - CATALYST SYSTEM FOR 1968-1974 MY CARS
  - MECHANICAL SYSTEM FOR PRE-1968 MY CARS

- RETROFIT REQUIREMENT TO BE LINKED TO VEHICLE REGISTRATION IN WASHINGTON METROPOLITAN REGION

- D.C. CITY COUNCIL HAS BLANKET AUTHORITY TO TAKE NEEDED MEASURES FOR EMISSION CONTROL -- HOWEVER, CONGRESSIONAL APPROVAL WILL BE REQUIRED

- ENABLING LEGISLATION FOR VIRGINIA AND MARYLAND NOT YET DEVELOPED; VIRGINIA LEGISLATURE NOW OUT OF SESSION -- RECONVENES JANUARY 1974; MARYLAND LEGISLATURE ADJOURNS IN APRIL

WASHINGTON, D.C.

REGION-PECULIAR FACTORS

- 231,300 PASSENGER CARS REGISTERED IN DISTRICT OF COLUMBIA
- 100,000 NEW TITLES ISSUED YEARLY, OF WHICH 30,000 ARE D.C. REGISTRATION TRANSFERS - ABOUT 70,000 CARS YEARLY OR 1/3 OF REGISTRATION IS NEW
- NEW REGISTRATION FRACTION FROM OUT-OF-DISTRICT IS NOT IDENTIFIED
- ACCORDING TO 1968 TRAFFIC SURVEY, LESS THAN 10% OF VMT IN THE WASHINGTON METROPOLITAN AREA FALLS IN EXEMPT REGISTRATION CATEGORY, WHICH INCLUDES THROUGH TRAVEL, TOURIST TRAVEL, AND TRAVEL BY DIPLOMATIC AND OTHER FEE-EXEMPT VEHICLES

WASHINGTON STATE

REACTIONS TO TWO CAR STRATEGY

- CALIFORNIA-ONLY STRATEGY WOULD IMPACT AIR QUALITY PLAN
- AUTO POLLUTION PROBLEM (CO) ONLY IN CENTRAL BUSINESS DISTRICT OF SEATTLE AND SPOKANE
- THEY HAVE CONSIDERED AUTO CONTROL STRATEGIES IN TWO COUNTIES ONLY
  - KING COUNTY (Seattle)
  - SPOKANE COUNTY (Spokane)
- WOULD HAVE REACTIONS AGAINST SPECIAL CONTROLS IN OTHER COUNTIES BESIDES KING AND SPOKANE
- SEATTLE AND SPOKANE MUST HAVE COMMON CONTROLS - DIFFICULTIES IF ONE IS MORE STRINGENT THAN OTHER

WASHINGTON STATE

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

- REGISTRATION
  - YEARLY REGISTRATION - COUNTY IDENTIFIED
  - NO CHECKUP
- INSPECTION PROGRAM
  - NO SAFETY PROGRAM NOW - HAD ONE 20 YEARS AGO BUT DISCONTINUED. NEGATIVE FEELINGS ABOUT SAFETY PROGRAM
  - BILL PENDING ON EMISSION INSPECTION PROGRAM
    - FOR TWO COUNTIES ONLY
- RETROFIT PROGRAM
  - NONE - LEGISLATURE UNWILLING TO INTRODUCE RETROFIT LEGISLATION

WASHINGTON STATE

REGION-PECULIAR FACTORS

- NEED CO REDUCTION OF 55% IN SEATTLE AND 48% IN SPOKANE

- STRONG REACTIONS AGAINST CONTROL IN RURAL AREAS AND COUNTIES OTHER THAN THE TWO COUNTIES CONTAINING SEATTLE AND SPOKANE. LEGISLATURE UNLIKELY TO VOTE FOR RIGID CONTROL OF MORE THAN THESE COUNTIES

- MANY NON-RESIDENTS BUY CARS IN SEATTLE BECAUSE OF BETTER PRICE - COULD COMPLICATE REGIONAL CONTROL PROBLEM

SUMMARY OF STATE OR REGIONAL ISSUES

- STATE OR REGIONAL REACTIONS TO TWO-CAR STRATEGY
  - CALIFORNIA-ONLY STRATEGY WILL IMPACT AIR QUALITY IMPLEMENTATION PLANS OF OTHER STATES - MOST STATES WOULD LIKE TO SEE EXTENSION OF IMPLEMENTATION PLAN DATE. HOWEVER - IMPACT OF ONE YEAR STRATEGY IS SMALL
  - MOST STATES SEE MANY PROBLEMS IN ADMINISTRATION OF AND CIRCUMVENTION OF REGIONAL CONTROL WITHIN A STATE - UNIFORM CONTROLS THROUGHOUT STATE GENERALLY PREFERRED
  - MOST STATES OR REGIONS FAVOR CALIFORNIA - ONLY STRATEGY - EXCEPTIONS ARE NEW YORK CITY AND DISTRICT OF COLUMBIA
  - CALIFORNIA DOES NOT WANT REGIONAL STRATEGY WITHIN THEIR STATE - WOULD ACCEPT CALIFORNIA-ONLY - STRATEGY FOR ONE YEAR ONLY IF EPA MANDATES A SUPPLY OF NON-LEADED GASOLINE THROUGHOUT COUNTRY
  - CALIFORNIA HAS SERIOUS RESERVATIONS ABOUT BEING THE ONLY STATE IN THE COUNTRY SADDLED WITH A CATALYTIC CONVERTER SYSTEM
  - PROBLEM ASSOCIATED WITH METRO REGIONAL STRATEGY ARE ACCENTUATED IF PRICE DIFFERENCE BETWEEN CARS IS LARGE
  - MANY OF REGIONS HAVE AUTO POLLUTION PROBLEMS CONCENTRATED IN SMALL CENTRAL BUSINESS DISTRICT AREA. OBJECTIONS PROBABLE IN HAVING STRINGENT CONTROL OUTSIDE THIS AREA

SUMMARY OF STATE OR REGIONAL ISSUES

REACTIONS TO TWO-CAR STRATEGY

- GENERAL FEELING IS THAT FOR ONE YEAR DURATION A TWO-CAR STRATEGY MAY NOT BE WORTH THE DIFFICULTY OF SETTING UP A SHORT-LIVED ADMINISTRATIVE PROCEDURE

- MANY STATES SUCH AS NEW YORK, TEXAS, MASSACHUSETTS, AND UTAH FELT THAT CONTROL OF A METROPOLITAN AREA WOULD BE AN ISSUE UNLESS ALL SIMILARY-AFFECTED METROPOLITAN AREAS WERE INCLUDED

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SUMMARY OF STATE OR REGIONAL ISSUES

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

- CALIFORNIA HAS UNIQUE EXPERIENCE AND PROCEDURES FOR ADMINISTRATION OF TWO-CAR CONTROL PROGRAM
    - CERTIFICATE OF COMPLIANCE WITH EMISSION LAWS REQUIRED AS CONDITION FOR REGISTRATION
    - REGIONALLY CONTROLLED RETROFIT PROGRAM
    - ASSEMBLY-LINE INSPECTION PROGRAM
- NEW CALIFORNIA LAWS ARE STILL REQUIRED TO IMPLEMENT PROPOSED TWO-CAR STRATEGY
- NEW JERSEY WILL HAVE MANDATORY EMISSION INSPECTION PROGRAM COMMENCING JULY 1, 1973 - TIED INTO EXISTING SAFETY INSPECTION PROGRAM. INSPECTION REQUIRED FOR REGISTRATION. POSSIBLE MEANS FOR TWO-CAR STRATEGY CONTROL
- MANY STATES HAVE MANDATORY PERIODIC SAFETY INSPECTION, HOWEVER FEW ARE TIED TO REGISTRATION.
- NO EXISTING REGULATIONS REQUIRE PROOF OF RESIDENCY FOR REGISTRATION
- SOME STATES DO NOT IDENTIFY COUNTY ON REGISTRATION
    - MAY REQUIRE NEW FORMS OR DATA HANDLING PROCEDURE TO IDENTIFY REGISTRANTS IN CONTROL REGION

SUMMARY OF STATE AND REGIONAL ISSUES

BACKGROUND/EXPERIENCE RELATED TO VEHICLE CONTROL

- SEVERAL STATES SUCH AS OREGON, WASHINGTON, AND ARIZONA HAVE PLANS FOR REGIONAL EMISSION INSPECTION PROGRAMS. THESE ARE TIED TO AREAS WITH AUTO POLLUTION PROBLEMS

- SOME STATES LIKE NEW YORK CITY AND WASHINGTON, D.C. HAVE PROPOSED REGIONAL RETROFIT PROGRAMS

SUMMARY OF STATE AND REGIONAL ISSUES

REGION-PECULIAR FACTORS

- CALIFORNIA'S SIZE, POPULATION DISTRIBUTION, AND BORDER SITUATION LENDS ITSELF TO TWO-CAR STRATEGY CONTROL
- PROXIMITY OF POPULATION CENTERS IN A NUMBER OF EAST COAST REGIONS REQUIRES INTERSTATE CONTROL ZONES FOR EFFECTIVE CONTROL
- MANY OF THE AIR QUALITY CONTROL REGIONS CONSIDERED FOR CONTROL ARE LARGELY RURAL WITH ONLY LOCALIZED MOBILE SOURCE POLLUTION PROBLEMS
- ALASKA AND COLORADO HAVE UNIQUE SITUATION
  - 1975 EMISSION CONTROL SYSTEM MAY NOT BE EFFECTIVE FOR ALASKA PROBLEM
  - COLORADO AND OTHER HIGH ALTITUDE AREAS REQUIRE WAIVER TO ADJUST EMISSION CONTROL SETTINGS FOR HIGH ALTITUDE